

NAUGHTY!

JAPAN'S diligent fishermen have often been criticised for taking more than their rightful share of the fish in many parts of the world. This time some of them have been accused of cheating over quotas and boat size rules and the accusation has been made in Japan itself.

Writing in *Asahi Shinbun*, Japan's largest-circulation daily newspaper, Katsuchi Honda has alleged that in the North Pacific a 20-ton boat is registered as a 9.9 tonner: fishermen are violating protection zones and are catching more than they should: they are also cheating over the size and number of nets and over amounts of fish taken into the factory ships.

While it has been conceded that there may be a basis for some of the allegations, the fishermen and their industry are furious about the publication of the article just as Japan and Russia are about to begin a new series of talks over the Japanese catch.

Canada gives hake quotas

FOREIGN fishing vessels are to be allowed to catch 18,000 tons of Pacific hake a year within the 200-mile limits of Canada's west coast.

Hake has never been a popular fish with the Canadian fisherman or the Canadian consumer, and this quota reflects federal policy to allow foreign ships to take species not required by the local industry.

The catch allocation is 5,000 tons to Japan, 6,500 tons to the USSR, and 6,500 tons to Poland. Most of the hake will be fished off the lower west coast of Vancouver Island, well inside the 200-mile economic zone.

Canada has also allocated 1,500 tons of black cod to Japan. This is normally taken in depths from 200 to 1,000 fathoms by long line.

KRILL IN FJORDS

THERE are "enormous" quantities of krill in North Norway fjords, according to Chris Hopkins, who has headed a scientific expedition in the research vessel *Johan Ruud*.

The krill has been discovered on a stretch of coast from Vest Fjord in the south to Porsanger Fjord in the north.

Trial fishing suggested that krill could be taken at the rate of 2½ tons an hour, but the expedition leader says that a special trawl is required as well as high-frequency detection equipment.

In the Barents Sea, Soviet fishermen have been catching krill for the production of a paste.

Loan plan

THE Philippines government is planning to seek a loan from the World Bank to finance ten regional fishery schools.

Waldo S. Perfecto of the Department of Education and Culture says that a special team is now carrying out a feasibility study for the government.

Payments for North Sea oil debris damage

NORWEGIAN fishermen have received nine million kroner (almost £900,000) in compensation for damage caused by oil activities in the North Sea.

More than 1,100 claims have been approved by the Fisheries Directorate. About half of them relate to damage sustained in the Norwegian sector and the rest in the British sector.

Ocean scientist Thor Heyerdahl Jr., son of the explorer — says that drilling rigs and supply vessels are still dumping considerable amounts of debris.

Claims by fishermen are examined by a committee of experts, and approved, sealed

down or rejected after careful examination.

The cost of clearing debris from the seabed in the Norwegian sector of the North Sea has cost oil companies 100 million kroner (almost £10 million) so far, claims MEA, organ of the Norwegian Fishermen's

Association. This is equivalent to the cost of drilling three wells.

Documentary evidence, involving use of echo-sounders, is required to show that clearance has been effective.

According to MEA most of the rubbish is left by sub-contractors, but to the Norwegian authorities the oil companies are responsible.

No similar clearance has been carried out in the British sector of the North Sea, although MEA attributes this to "the relatively weak position of British fishermen vis-à-vis the British authorities and oil industry."

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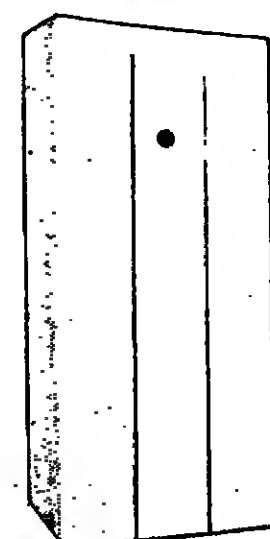
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A CHILEAN purse seiner using South African net handling equipment has cut her catching time by nearly half.

The boat, the 26-metre long *Lientur* (pictured above) working out of the northern Chile port of Iquique on anchovy shoals, would normally take about 70 minutes from shooting her net to pumping the fish aboard.

With the new handling system supplied by Petrel Engineers of Cape Town, and working with a sea anchor and a side thruster instead of the traditional small boat (panga), this time has already been slashed to 45 minutes. As the crew gains experience, it should go down to 30 minutes.

Astonishing

The speed-up has astonished fishermen in the area, reports *FNI* correspondent Michael Stuttaford from Cape Town. A second boat now building is to have the equipment fitted.

In addition to the side thruster, the equipment that has transformed fishing for the *Lientur* consists of a net hauler and a net stacker. The ramp for the panga has been replaced by a net bin.

The Petrel system results from the Cape Town company's 18 years of experience of supplying to purse seiners. It is claimed to be highly competitive both in performance and in price.

Anchovy purser cuts catch time by half

"We are exporting at the lowest possible cost," says Petrel managing director Hans Strauss. "We believe that our prices are the keenest in the world."

For a description of this time-saving system and how it works, see picture report on Page 3.

INSIDE YOUR 72-PAGE ISSUE

- Norway blue whiting record. 2
- No "back door" into Canada. 4
- Costa Rica toughens tuna controls. 12
- Rush to new Australia grounds. 16
- UK fishing industry report. 20
- Boatbuilders visit India. 24
- Canada fish export drive. 30
- Catch 78 exhibition in Scotland. 39
- Taiwan shows new uses for fish. 62
- Plans for Sahel's fish wealth. 65

Norway blue whiting boom

BY THE END of May, a fleet of some 40 Norwegian ships fishing for blue whiting in the north-east Atlantic had landed a record catch of more than 100,000 metric tons.

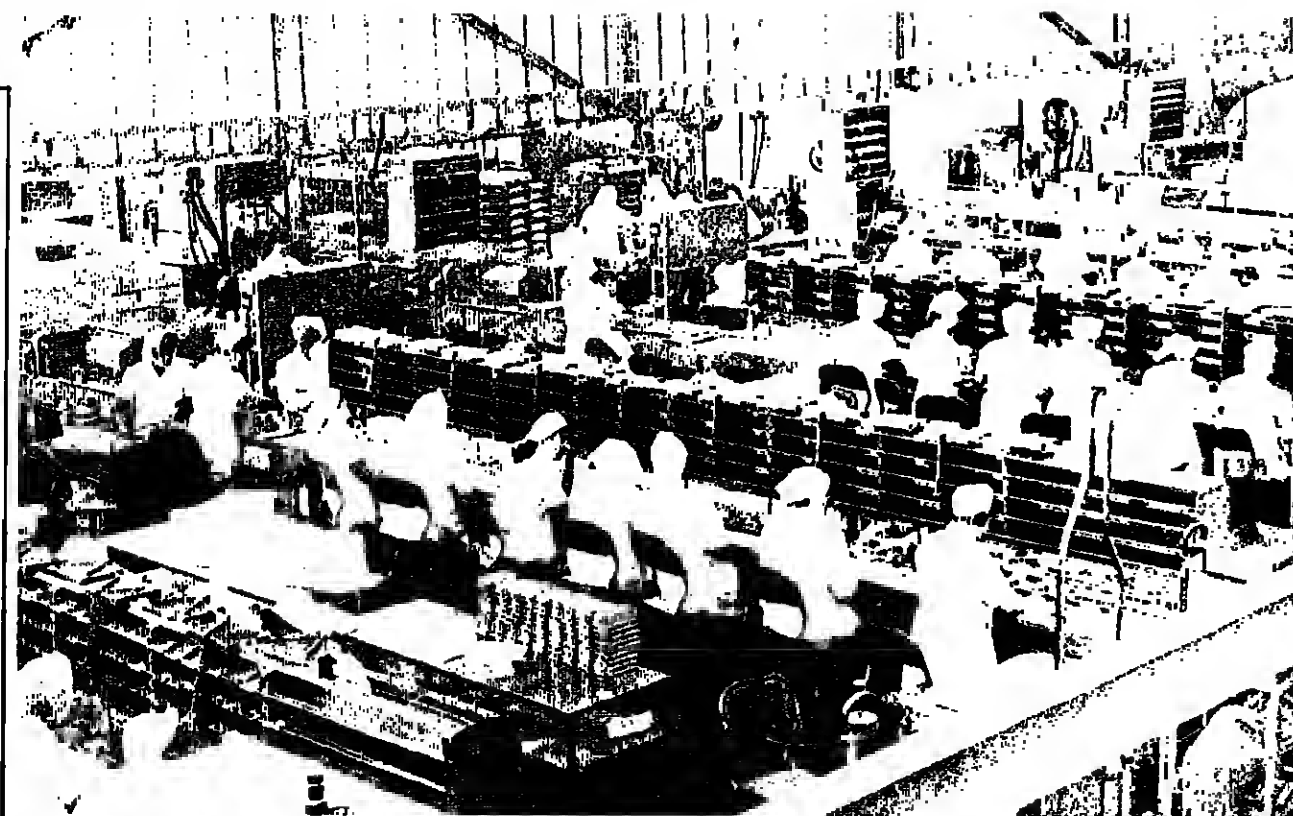
The previous record for Norwegian vessels was set in 1977 when they caught 38,000 tons.

This year the fleet was augmented by several new high capacity purse seiners (See FNI April 1978) and these ships turned in some outstanding performances.

Operating mainly in the area of the Faroe Islands, the Norwegian ships came to port two and three times in May, each time with catches of 500 up to nearly 2,000 tons.

The fish was supplied to meal plants along the west coast.

The Lofoten season for spawning cod (skrei) ended in April with a total catch of 57,441 tons. This was the largest catch since the 64,908 tons of 1973 and was up by more than 10,000 tons on the catch in 1977.



Birds Eye fish finger line in action — more than £2 million has been earmarked for factory improvements.

BIRDS EYE FISH PLANT BOOST

ALTHOUGH UK sales of frozen fish fell last year — to 146,000 tons from 150,000 tons in each of the two previous years — the country's top producer is investing more than £2 million on improvements to its factories.

"Our investment programme," said Birds Eye Foods, "has already led to the installation last year of a new cod-in-sauce line at our Hull factory and a £250,000 plaice machine at Lowestoft."

Some £2 million is now being spent modernising the fish finger lines in the big Grimsby factory. In the Hull factory, an experimental line is being set up to ease the making of fish blocks through the filleting, skinning and block-forming stages.

But, like many other people involved in the British fishing industry, Birds Eye chairman Kenneth Welsh is concerned over the uncertainty caused by the failure of the EEC countries to reach agreement over fisheries policy.

Speaking at the presentation of the Birds Eye Annual Review last month, he urged them to bring in a speedy conclusion their discussions about who should catch what and where. "This," he added, "will allow those of us with processing plants and jobs to protect our livelihoods to sort out our investment priorities."

Birds Eye is having to join in the search for possible new food fish species to replace some now less abundantly available. To help, the company had a survey done into how venture-some British businesses are when it comes to unknown fish.

Some 21 species of fish and shellfish were listed. The familiar cod, haddock, plaice and kippers scored from 85 to 96 per cent. But, despite the mackerel's rise in prominence in British fishing, only 60 per cent. of the women in the survey had even tried the fish.

Sole (51 per cent.) and lobster (43 per cent.) may miss out because of scarcity

Peru short of meal

LAST MONTH Peru was industrial fishing on almost an exploratory basis in an effort to cover her fish meal and oil needs.

Meal plant catching of anchovy is normally stopped in May or early June to protect spawning fish. The closed season or vedra usually lasts until September or October. There has, however, been considerable chopping and changing since fishing for other species was included a year ago.

This year, the Ministry of Fisheries authorised 60 boats to start fishing for sardines, jurel and Pacific saury in mid-April. A few weeks later the high proportion of small anchovy in the catches forced a cut in the permitted fleet to only 30 boats.

From May 12, twenty additional boats were allowed to fish for anchovy in the far south of Peru off Ilo. This was because Peru does not want to miss out on anchovy in the area when Chile is having good years.

Epchop, the state meal and oil company, has only enough stock on hand until the end of July to meet outstanding commitments and to cover local market requirements. It has stopped selling

fishmeal and is only making spot sales from small amounts of meal produced from the present limited industrial fishing and from food plant waste.

To cover the local market only, Epchop will need a further 47,500 tons. Local consumption amounts to around 115,000 tons a year. All the fish oil produced is also absorbed by the local market.

In 1977 Epchop sold 394,000 tons of meal for export at an average price of US\$425 per metric ton FOB. The average price this year has been \$435.

Pilchard imports plunge

THE EFFECTS of the South West African pilchard slump are beginning to show in British imports. Over the four years 1974-77, UK importers have taken an increasing amount of pilchards packed in the big canneries of Walvis Bay. From 1,260,317 cartons (48½%) the supplies grew to 2,030,780.

In the first quarter of 1977, South African pilchard imports amounted to 466,191 cartons, but they fell to only 72,290 cartons in January-March 1978. Although this is due partly to the high level of imports last year, the main reason is the sharp fall in Walvis Bay

production. Commenting on the catch drop in its report for the year ended September 1977, the Fisheries Development Corporation of South Africa notes that output is not likely to be adequate even to meet local demand over the year to September 1978. In 1977, only the substantial carryover of stocks from the 1976 catch made it possible for packers to meet the strong demand for pilchards in export markets. To hold markets built up over years, the South African packers have been looking into the possibility of obtaining supplies in other countries.

STAR KIST TUNA PLAN

THE GOVERNMENT of Papua New Guinea has been negotiating with Star Kist of California for a joint venture tuna cannery.

To be sited on Man Island, the project will be the processing of skipjack both for export and domestic consumption.

With the declaration of 200-mile EEZ this year, Papua New Guinea now has 700,000 square miles of fish waters. It is estimated that fish catch potential within the area is at least 100,000 tons a year, mostly tuna and billfish.

The country is already a supplier of skipjack for needs landing base, processing plants to handle catches which exceed 50 tons a year.

Indonesia is another country with growing production and exports of tuna. Exported 1,400 tons in 1977 and are expected to reach 2,000 tons this year.

Indonesia's total fish catch should rise to about 1,600 tons in 1978. Exports of fish may reach 73,800 tons, fish consumption will average 11.2 kilos per capita.

Epidemics stop fishing

Epidemic of cholera and gastro-enteritis have spread to 93 islands in the Indian Ocean Republic of Maldives. The country's two main industries — fishing and tourism — have stopped.

Two international companies have stopped buying fish from the islands.

The smallest independent country in Asia, Maldives consists of some 2,000 small islands forming a chain 700 km long and 129 km wide.

Maldivian fishermen go to sea almost every day in thousands of boats built of coconut or other indigenous timber. The boats are around 11 metres long, carry crews of some six men, and travel 20 to 32 km out from the islands.

Chile seiners' South African system

A GEAR handling system designed and made by a Cape Town engineering firm has enabled the Chilean purse seiner *Lientur* to bring her fish aboard in about half the time it usually takes.

The 26-metre *Lientur* is a steel-hull purse seiner working out of the northern port of Iquique. The fish caught are anchovy for reduction to meal, and the time taken to shoot the net and pump in the catch is usually around 70 minutes. Using the new system, the *Lientur* does all this in about 45 minutes. With experience, the operation should be carried out in 30 minutes.

The equipment includes a sea anchor to replace the cumbersome small boat (panga) for shooting the net, a net hauler, a net stacker and a retractable side thruster mounted as a unit with the stacker.

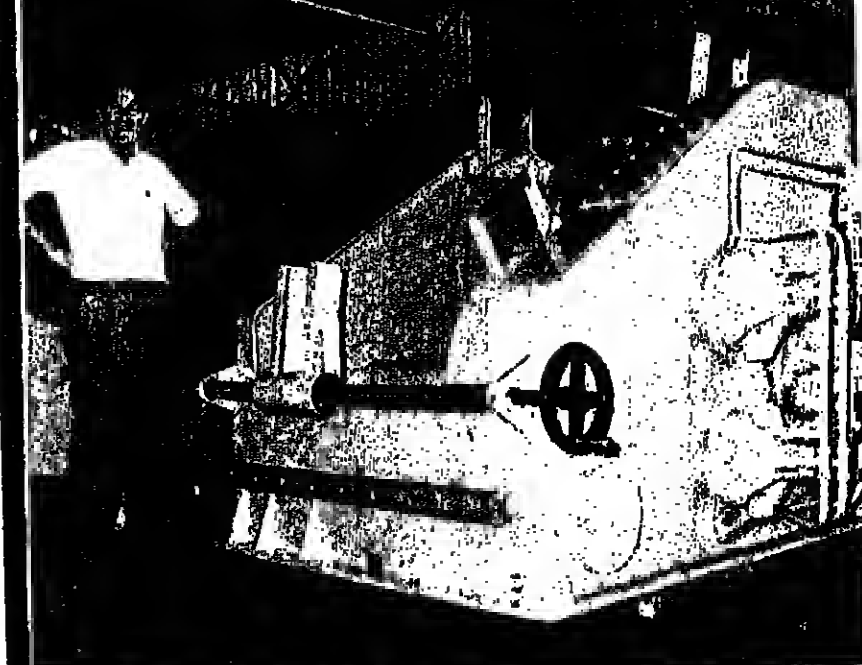
Petrel Engineers of Cape Town supplied the equipment which was shipped out in two 20 ft ISO containers.

It was installed in the *Lientur* under Petrel supervision. Apart from the fact that the net was inadequate, it worked well from the start.

The boat's ramp for her seven-ton panga was replaced by a net bin, which was built along the port rail, across the transom and on the deck just inboard of the starboard rail. The net stacker and side thruster were mounted on the starboard quarter, the stacker reaching over the entire bin. The net hauler on a short, unstayed mast, and its idler roller which ensures maximum grip by the hauler sheaves on the net, were mounted to port forward of the net bin.

An existing winch was mounted to starboard forward of the dewatering plant immediately aft of the superstructure. In addition to fabricating their own design of equipment, Petrel Engineers were responsible for the design and installation of the entire hydraulic system to operate the plant. Another boat now being built in Peru will have a similar system plus a parallel-drum purse seine winch, the first of its kind built by Petrel Engineers. (South African purse seine winches have in-line drums).

The bottom drum of the new winch is used for shooting the purse warp.



The parallel drum purse seine winch working on Chilean vessels



The main upper drum, which is geared for spooling, is for hauling the front end of the purse rope. The smaller upper drum is for hauling the aft line.

There are three Staffa B30 hydraulic motors driving a gear train with a 6.6:1 reduction. (South African winches, because of their configuration, have a worm gear).

The gear system gives a maximum pull on an empty drum of 20 tons. At the end of the pulling the pull is nine tons.

The cost of the parallel-drum winch made by Petrel Engineers is about one-third of its equivalent made in the USA and Europe, but it is about 25 per cent. more than the standard in-line drum South African winch which occupies more deck space.

Petrel have also supplied seven fish pumps to Chilean boats.

Net stecker over the net bin on a Chilean purse seiner. The side thruster is retracted in the frame which supports both it and the net stecker.

NO MORE FACTORY TRAWLERS

THE Fishery Committee of the Norwegian Storting (Parliament) has recommended by a narrow majority that the Norwegian factory trawler fleet of 13 ships should not be allowed to expand further. The decision was influenced by the Committee's concern for fish resources and district development along the coast of northern Norway.

This recommendation supports the majority view of the commission that prepared the long-term plan for Norwegian fisheries which is now being discussed by the various fishery organisations.

The plan envisages the gradual reduction by normal attrition and the eventual demise of the factory-trawler section of the industry. But this is contested in some quarters in view of the fact that trawling and processing at sea is one of the most efficient, and profitable, of Norwegian fishing operations.

Present fishery policy is to allow no more licences for building new factory trawlers, or for conversions.

Tuna boost

THE INDIAN government is to establish a development corporation to assist the exploitation of tuna and related fish found in the country's 200-mile zone.

It has also been decided to set up a yard to build ships for tuna fishing, as well as a research and training centre.

An initial amount of Rs 500,000 (£30,000) has been set aside for the first stages of the project over the year ending March 1979.

AID UP

NORWAY AID to developing countries totalled 1,569.7 million kroner (about £160 million) in 1977, up 32 per cent. from 1,191.3 million kr. the year before. This aid corresponded to 0.82 of the country's gross domestic product.

In its report for the year, the Norwegian Development Aid Agency (NORAD) said that fishery projects accounted for nine per cent. of the amount spent in 1977.

PERU has renewed a contract with Rybov in Poland for the joint venture involving 100 trawlers. Under this contract, three to six Polish trawlers will work off Peru for a further two years. Originally signed in 1971 and renewed every two years since then, the contract is mainly for Pacific hake, mackerel and turbot.

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No 'back door' into



Fisheries Minister LeBlanc

'Maple Leaf must not become a fishing flag of convenience'

CANADA INTENDS to develop the resources inside her 200-mile zones into one of the world's top producing and export fisheries. And she means to do it on her own, with her own fishermen and her own money, if a speech by Fisheries Minister Romeo LeBlanc at the Fisheries Council of Canada meeting in Quebec City in May is any indication.

Without mentioning names, he said: "Foreign capital investment need and should not become a major feature of the Canadian fishing industry. We did not get the 200-mile zone to let it be taken over by the back door, with foreign companies borrowing our flag to catch our fish. I do not want to see the Maple Leaf become the world's fishing flag of convenience."

We can develop on our own says Minister

He then asked where was the great need for joint ventures that were being so loudly lobbied for. He could not understand the "colonial attitude" that Canadians were underdeveloped in fisheries, "that we who set an example to the world in getting this zone have no idea how to use it without

someone showing us."

Because the provinces were free with advice to him, he would offer some in return. He said the wisdom of rapid expansion — especially on the basis of provincial rivalry — should be considered carefully when there was 31 per cent over-capacity in frozen fish

Canada

plants in Newfoundland, 45 per cent in the Maritime provinces, and 65 per cent in Quebec.

"Were we totally lacking in fleet and facilities," he continued, "foreign investment might be a different story. But we already have the basic facilities, often with over-capacity."

Strong position

"Where we need new fishing techniques, we are already developing them or can purchase them. Because of our supply of fish, we are also in a strong position to enter co-operative fishing arrangements with foreigners, whereby we learn their methods of

fishing and processing, and expand into their markets without losing any of our ownership."

These remarks came as the federal Foreign Investment Review Agency considered an application by the Nordsee fishing company of West Germany to buy a 51 per cent interest in a fish plant at Harbour Grace, Newfoundland.

Minister LeBlanc is known to be opposed to the takeover and a favourable recommendation would be fought by him in the cabinet.

While the agency takes its time with the application, there are rumours that several other foreign companies are waiting for a green light to buy into the Canadian industry.

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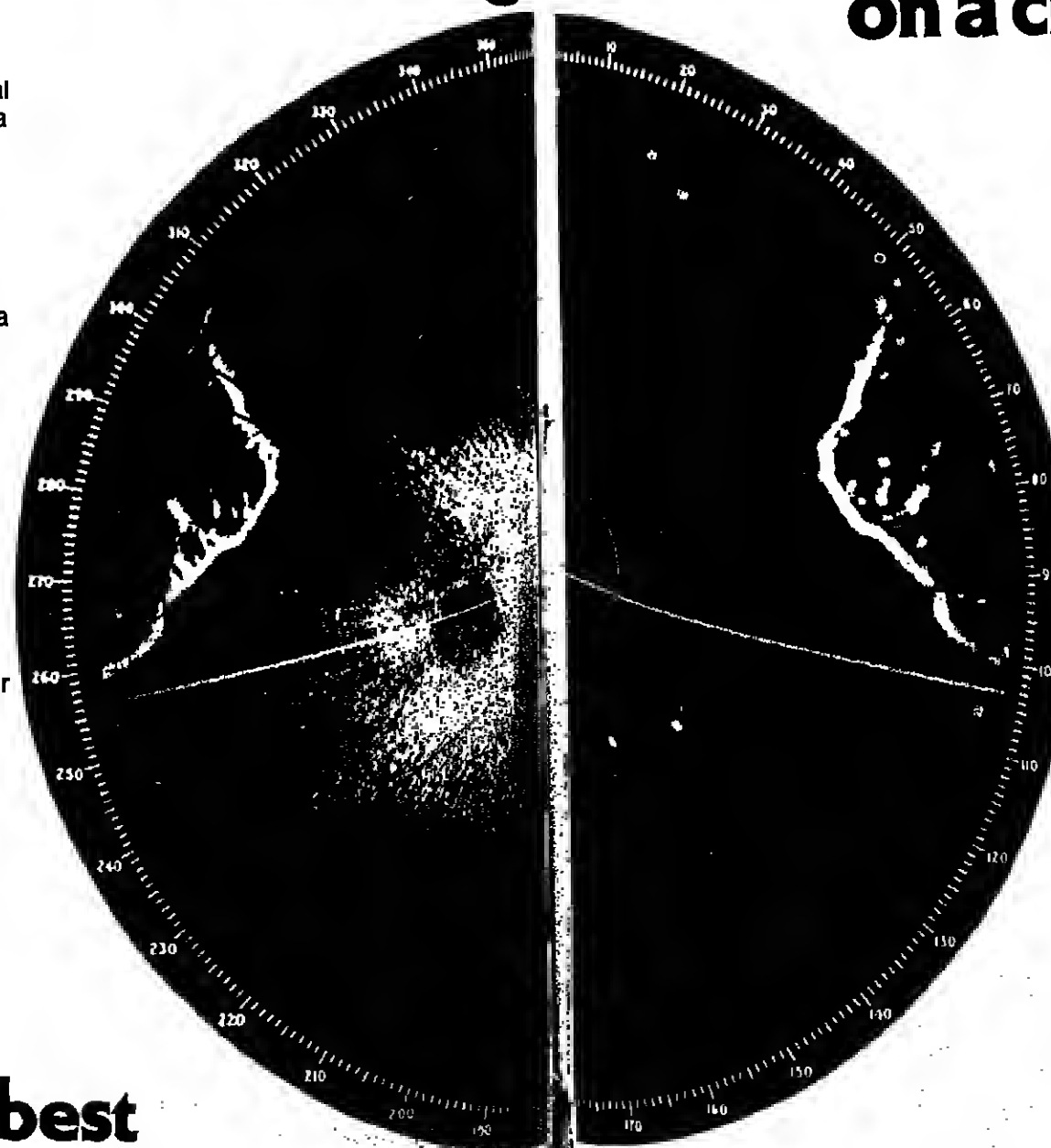
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UNDER ARREST!

Russian skipper 'misunderstood'

THE RUSSIAN trawler *Spekt* of Kaliningrad last month became the fifth fishing vessel to be arrested by the Norwegian Coast Guard since enforcement of protection inside the 200-mile limit was tightened up in February.

She was brought into Bergen, where her skipper was charged with having no outside net around the cod-end.

Boats found fishing in the new prohibited zones around Svalbard (Spitzbergen) and Bear Island could be barred from the Norwegian EEZ.

When the rules for the zones came into effect on May 15, the Norwegian Fisheries Ministry said foreign vessels that defy them will not be seized. Instead, their owners will get a written warning from the Coast Guard and ultimately they could be banned from the Norwegian zone.

The Soviet Union has repeatedly opposed Norway's claim to apply protective controls around these island groups. The Russians view the Barents and the Norwegian Seas as a single ecological system and claim that Norway has no unilateral right to establish such regulatory provisions.

Like other skippers arrested before, he claimed that he had misunderstood the Norwegian regulations about gear. He was fined 15,000 kroner (about £1,500) and lost catch and gear of about the same value.

According to Fishery Director Knut Vardal, there will be no change in the substance of the regulations about gear. But the wording is being reconsidered and may be made clearer.

Just after the arrest of the *Spekt*, the Coast Guard was instructed to release two Dutch vessels, the *Johanna* and *Monica*, and escort them out of the Norwegian zone.

They were trawling for mackerel but claimed that the ban on taking this fish before

the middle of July applied only to catches for meal plants. The Fisheries Department decided to give them the benefit of the doubt.

But this did not please local fishermen, particularly when one of the Dutch skippers said he had received permission a week before to enter the Norwegian zone to catch mackerel.

NIMROD FOILS SPANISH

ILLEGAL fishing inside the British sector of the EEC 200-mile limit last month cost the skippers of two Spanish trawlers a total of £31,500. It was the first time that an RAF Nimrod patrol aircraft was involved in a limits arrest.

The trawler *Gilzude Argia* was spotted by the Nimrod (which was on fishery protection patrol) 28 miles south-west of the English coast. Initial attempts to stop her failed. But she was eventually arrested and brought into Milford Haven.

In the court there, her skipper admitted fishing in the EEZ without a licence, fishing with illegal nets and failing to stop when ordered. He was fined £15,100.

In the same court the day before, the skipper of the Bilbao trawler *Gorichio* was fined heavily on similar charges.

She was picked up by the protection ship *HMS Stubbington* 28 miles inside the limit. Her skipper refused to take his ship to Milford Haven and so an armed party was put aboard.

FIRM LOSES LICENCE

SRI LANKA'S Minister of Fisheries, Festus Perera, has cancelled the licence of the Singapore firm which had been given permission to trawl within the island's economic zone from 24 miles off the coast.

The firm's two trawlers were, it was alleged by the Sri Lanka Navy, operating near San Pedro, inside 24 miles.

Two firms, from Singapore and Hong Kong, were permitted in February to trawl within Sri Lanka limits, provided they kept outside 24 miles and supplied 40 per cent of their fish to Sri Lanka.

The owners of the Taiwan vessel *Chien Chuan* have paid US\$100,000 to have her released after she had been fined in Sri Lanka.

The *Chien Chuan* was caught fishing in the Sri Lanka limit off the coast of Mannar last year.

This was the first time, said Minister Perera, that the Sri Lanka government had taken such firm action against poaching inside its fishing waters. New legislation will provide powers to confiscate offending vessels and to impose fines of up to \$200,000.

PROTEST BLOCKS PORTS

IN A BITTER protest against loss of fishing grounds in the Baltic Sea, Danish fishing boats blockaded Copenhagen and several other harbours for periods of up to eight hours early last month.

Further blockades were threatened but were called off when the government offered 74 million kroner (about £7.3m.) in low-interest loans and other assistance.

Danish fishermen in the Baltic Sea have lost out to 200-mile limit claims by coastal countries such as the USSR, Sweden, Poland and East Germany.

This year, Denmark's share of the Baltic catch was cut by 50 per cent. And by the end of April, Danish fishermen had already taken 75 per cent of their year's quota.

The fishermen blame part of their problems on the EEC, whose conservation measures in the North Sea have intensified pressure on Baltic stocks. They also allege that failure to reach agreement on fishery policy within the EEC has weakened the Community's bargaining position for adequate shares of the resources in the Baltic and other areas.

NORWAY AID

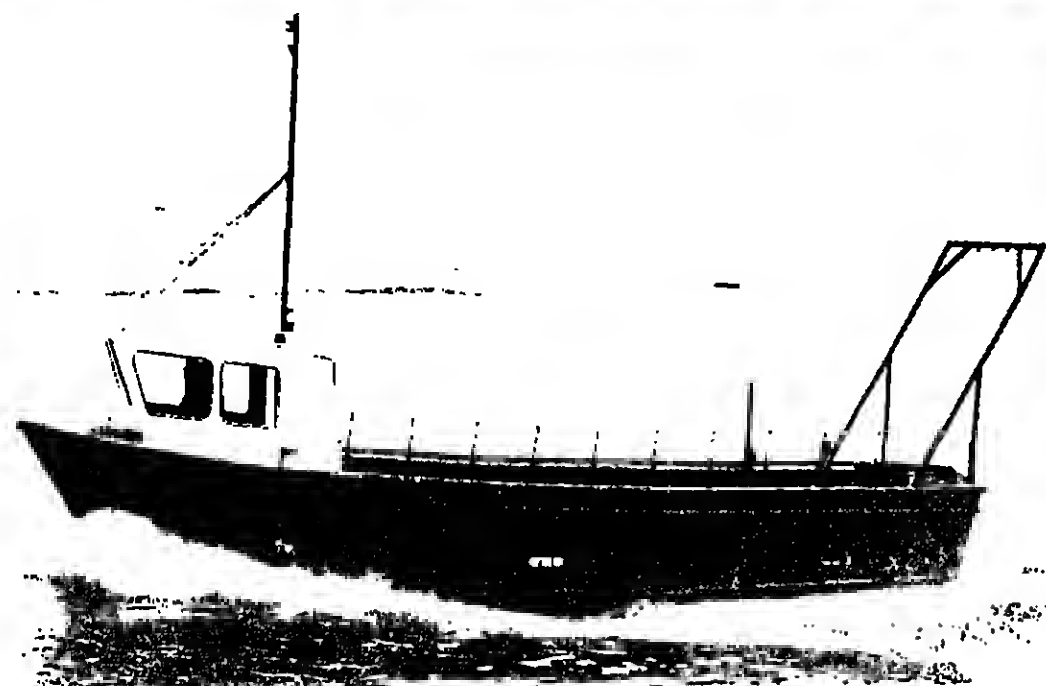
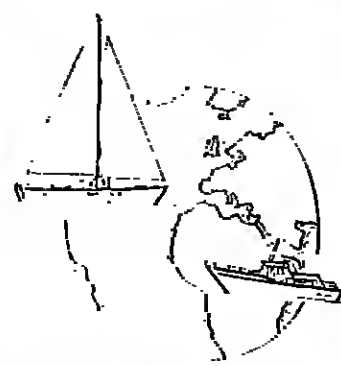
IMPROVEMENT of fishing techniques is among the projects in Kenya which Norway will assist through technical and economic aid. In terms of an agreement signed recently in Oslo, Norway will provide about £35 million. This year, the various projects will be covered by 81.6 million kroner (including

16.6m. carried over from 1977). In 1978, assistance will amount to 70m. kroner. For each of the following three years it will be 75m. kroner.

The assistance will be in the form of financial aid and expertise to be employed in Norwegian projects that include development of Kenya's fishing industry.

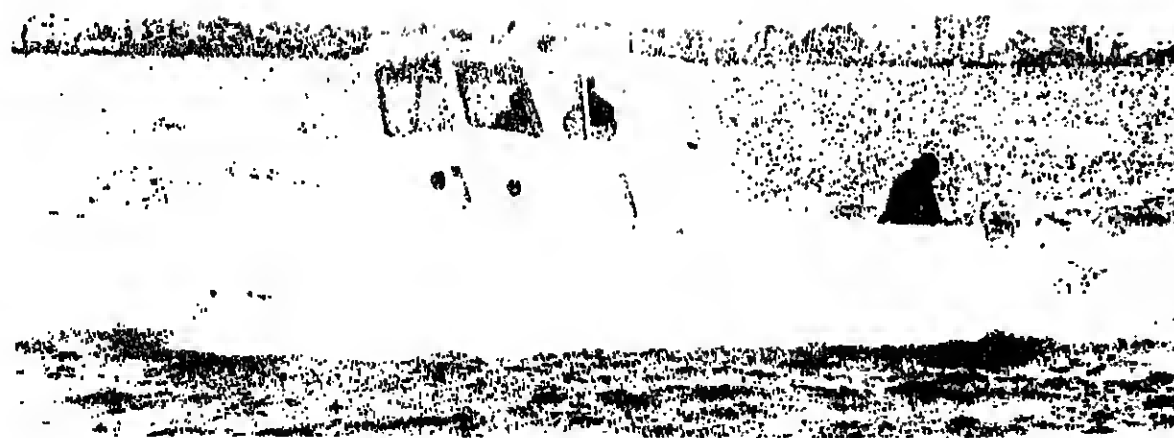
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PUBLISHED MONTHLY

"Fishing News International" provides full and
up-to-date information about the activities of
fishery industries world-wide.

It reaches and serves fishermen, fishing
companies, processors and distributors in
more than 160 countries and territories. It
circulates among members of governments
and international organisations, and among
fishery administration and research workers.

Readers also include designers and builders
of fishing craft, makers of fish finding
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machinery, consultants, operators of fishery
protection services, and the many other
people engaged in an industry that is
harvesting and handling 73.5 million tons of
aquatic creatures and plants a year.

No quick solution to fishing problems

comment

AT FIRST glance, the House of Commons
Expenditure Committee report on the British
fishing industry seems to say little and to have
observed even less of the intricate problems of
fishermen, trawler owners, processors and
merchants and all the many others who make
up the industry. But it repays careful reading.

The ten-man sub-committee appointed to carry
out the investigation was not seeking a panacea
to all the ills afflicting the industry. It was looking

into the way the government has
invested in fisheries and what
might be done in the future, either
to curb outlays of public funds or
to increase them in the national
interest. On such terms of
reference, the industry and most of
its supporting organisations have
come out remarkably well. And
the unspoken message is that there
is no single, simple way to save
ailing ports, slow down the
depletion of fleets, or to bring in
more of the popular species of fish.

On the immediate future
of fishing based on heavily worked
stocks such as those of cod,
haddock or herrings, the
Commons sub-committee is as
pessimistic as a Lowestoft bio-
logist or an ICES official. Perhaps
disturbing its own impressions of
a very complicated subject, it notes
the view of the UK fishery
research directors that, in EEC
waters, reduction of fishing effort
called for on conservation grounds
could be 30 to 40 per cent.

While this may not mean that
actual supplies will fall by this

amount, it offers no early prospect
of improved opportunities for the
British fleet. For the worst-hit
distant water trawlers, it is difficult
to disagree with the witness who
said these were now part of the
"dying side of the industry."

Opportunities

But the sub-committee urges
that this should not happen.
Perhaps in blue whiting, in
deepwater species or even in
waters far south, there may yet be
a chance. The trawlermen are
urged to seek it.

Cynics sneering on the sidelines
and watching with ill-disguised

glee the locust years of a once
proud and powerful industry may
say these MPs are singularly naive
in expecting any display of fresh
enterprise from the trawlermen of
Hall, Grimshy or Fleetwood. But
this may well be the time to forget
what was done wrong in the past,
or what opportunities were
offered and ignored.

If the sub-committee is naive in
urging trawlermen to try and
disprove the pessimists, then let us
have more of its approach. For the
traditions of the trawler ports and
all they represented in experience, in
an understanding of fishing, and a
commitment to the industry are
too valuable to be casually
discarded.

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المولات المظلمة ٢٠ - ١٢٠

مولات الاستملاك ٢ - ٢١٠

المولات القفصية ٧٥ - ٢٥٨

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Wesmar news

Dragger hang-ups cut by sonar

AN EXPERIENCED sonar operator, Roger Greene of Wadoboro, Maine, USA, finds WESMAR's scanning sonar the perfect instrument for draggers.

"It's the best sonar I have ever seen," he said. "There's no point in going fishing without the WESMAR scanning sonar."

Greene drags for such bottom fish as cod, haddock and sole. "We fish the cracks or lingers between the hard bottom," he reported. "The fish bunch up in these cracks. Without the scanning sonar, it would be impossible to fish here."

Some fishermen have used bathymeters to read the bottom, but Greene maintains that it takes years of experience before a fisherman can use a bathymeter successfully in his area.

"Some fellows have taken 20 years to learn the bottom," he said, "but with the WESMAR it takes very little time at all."

The WESMAR has excellent clarity," said Greene. He believes clarity in bottom discrimination is especially

important to the dragger, not only to locate the fishing grounds but to locate the rocks that could damage the net.

"I can see hang-ups with the WESMAR sonar that I couldn't see last year. I use the 1,000ft. range to see the hang-ups way before I get to them," he said. "I can tell the difference between schools and bottom."

Greene also is impressed with WESMAR's concern for the customer.

From the moment he purchased his first unit from Lew Grant of Omni Electronics in Rockford, Maine, he has had excellent service. "After my other boat sank," he said, "Lew Grant lent me a sonar until my new WESMAR sonar arrived. That tells me something about the company."

"I wouldn't have done as well as I have if I hadn't had the WESMAR sonar," Greene said. Serepta and the *Oui Vive* say they are very impressed by Buchan's success with the SS230, and that it is by far the best sonar they have seen for the money.



Roger Greene monitors bottom with WESMAR

WESMAR helps in pilchard fishing

IN OCTOBER, James Buchan, skipper and co-owner of the 85 ft. trawler *Amethyst* from Peterhead, Scotland, arrived in the Plymouth area in southwest England to participate in pair trawling for pilchards with the *Serepta* and *Oui Vive*.

With a short time it became evident to Skipper Buchan that the two sonar-equipped vessels were getting better results than he was.

In January, Skipper Buchan took a gamble. After two months of feeling as though he was falling behind in the three-way pair trawling arrangement, he decided to install a WESMAR SS230 scanning sonar in the *Amethyst* to see if he could improve his performance. Within a week he was spotting pilchards at a range of more than 1,200 metres. He knew then he had not gambled.

Using the SS230's modulated sweep display and digital readouts of range, Buchan is

able to determine both the size of the school and its distance from the *Amethyst*. Also, when several targets appear simultaneously on the SS230's CRT screen, he knows almost immediately which school is larger and closer.

Skipper Buchan states that even in poor weather he is able to obtain good marks at 2,800 feet (800 metres). WESMAR's patented transducer stabilization system compensates for pitch and roll of +26 deg., improving operation in rough seas. He says further that he is able to see pinnacles of rocks and rough bottom at up to 3,200 feet (1,000 metres), which help him avoid hanging up while bottom trawling.

Skipper Buchan says that he is extremely pleased with the WESMAR SS230's performance and that it has undoubtedly contributed to his success in pair trawling.

The skippers of both the



Jose Maria Azque with his WESMAR dual sonar system

Bermeo's seiners find bonito using sonars

TWO YEARS ago there were no WESMAR sonars in Bermeo, considered a progressive fishing port near Bilbao on the north coast of Spain. Fishermen there were using low frequency sonar equipment to find bonito with very little success.

They found bonito hard to detect, target information difficult to interpret, and discrimination poor. Because of these problems, combined with the initial high cost of the low frequency sonars, the Bermeo fishermen were very dissatisfied.

Captain Javier Munitiz was one of the first to try a WESMAR SS220 high frequency sonar. He installed it aboard his purse seiner *Miren Begona*.

Immediately his results were excellent and provided him with a profitable season. He said he was able to locate bonito and determine its exact location. He found he could rely almost entirely on his WESMAR, seldom using his echo sounder.

Before leaving Bermeo for the Azores in the last half of the bonito season he said, "I

wouldn't leave port without my WESMAR."

Word of Munitiz' success with WESMAR sonar spread quickly and impressed everyone in Bermeo. Other fishermen began ordering WESMAR SS220's and achieved the same results. They found that targets on the large (25 cm.) WESMAR CRT screen are clear and easy to interpret.

When the bonito season ended, many of the fishermen who had spent a great deal of hope and money with other sonars had installed WESMAR. By the end of September, 59 had followed Captain Munitiz' lead with many others planning to order WESMAR sonars.

The major commercial fishing out of Bermeo consists of two general seasons: anchovy and bonito. For the tuna, Bermeo fishermen go as far south in the Atlantic as the Azores. WESMAR sonar has had a history of success with both these fisheries, so it is of no great surprise to find such enthusiasm in Bermeo. Those sixty successful Spanish fishermen are unquestionable proof of the value of WESMAR sonars.



Bonito fishing fleet in Bermeo, Spain

Spanish spot tuna with WESMAR

JOSE MARIA AZOQUE, a well-known high line skipper from Orio, Spain, was the first Spanish fisherman to purchase WESMAR's dual sonar system. Comprising the SS230 low frequency sonar and the SS220 high frequency sonar, WESMAR's dual sonar system provides Azque with added versatility in his fishing.

Captain Azque has been a believer in WESMAR products for several years. He first bought WESMAR's SS150, and then later went to the computerized SS220. When WESMAR brought out its new SS230 low frequency unit, Azque immediately purchased the dual sonar package for his F/V *Madrin del Mediterraneo*.

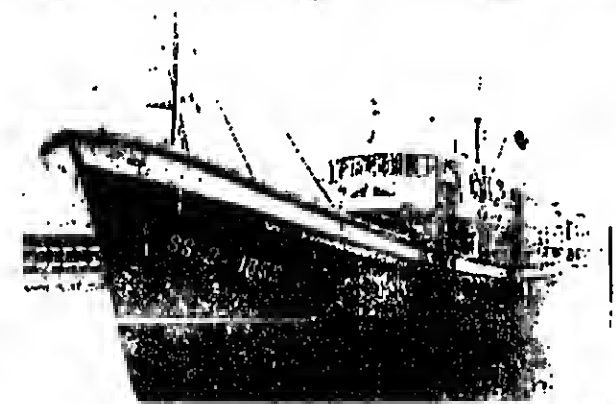
The two separate and complete sonars of the system operate individually or simultaneously for effective fish location. Both sonars sweep

360 deg. around the ship or scan a specific sector of water and feature digital readouts of target depth, horizontal distance, and slant range. Both sonars also feature WESMAR's patented transducer stabilization system for effective operation in rough waters.

According to the WESMAR agent in Spain, Espana De Ecomatros, Azque has found that the SS230 low frequency sonar has excellent target discrimination for tuna. He has also spotted small schools of mackerel at 500 metres with the unit.

Since Azque purchased his first WESMAR scanning sonar, over 80 per cent of Orio's top fishing fleet have followed suit.

These fishermen agree wholeheartedly with Captain Azque when he says, "I wouldn't fish without my WESMAR sonar."



Equipped with WESMAR's SS220 and SS230, F/V *Madrin del Mediterraneo* successfully locates tuna

Albacore catch increased 50%



Ora Easton's 92-foot *Pacific Sun*

ORA EASTON, captain of the 92-foot *Pacific Sun*, says his investment in WESMAR scanning sonar paid off handsomely during his albacore season. Easton, a commercial fisherman for 25 years, fishes for tuna along the Pacific Coast.

With the WESMAR sonar, he no longer needs to rely on visual sighting to locate fish.

"Often we'd be running along and not see anything," Easton says. "No birds or other natural signs. Suddenly a 'blip' would appear on the sonar screen to the left or right of the bow. We'd head the boat that way, slow down, signal for chum, stop the boat, and have our hands — and our hold — full of albacore."

Captain Easton figures his WESMAR scanning sonar played a critical role during the best days of his fishing. "Scanning sonar probably increased our catch by at least 50 per cent."

When fishing for albacore, Ora Easton sets his WESMAR SS220B system with a sensitivity of about "five," and "zero" from "zero" to "one," depending on the amount of feed in the water, and tilt angle from "zero" to "ten," depending on sea conditions.

Easton said the WESMAR sonar was invaluable in locating where the fish were without depending on sometimes unreliable visual signs.

Norway should cut North Sea mackerel catch

NORWAY'S Institute for Marine Research has advised that the provisional quota of 190,000 metric tons for North Sea mackerel should be cut by half.

Persistent poor recruitment since 1969 is given as the reason. Quotas of North Sea mackerel are to be renegotiated between Norway and the EEC.

Norwegian fishermen reacted promptly to the bad news, saying it was sprung on them just when they were preparing for the summer fishing.

Fishermen have also been criticizing another nagging regulation — the ban on Sunday mackerel fishing.

At the annual meeting of Norges Sildesalg, Director of Fisheries Knut Vardal, agreed that the present enforcement of the law was unfortunate and that the time was ripe for a revision of the Sunday ban.

A provisional arrangement that might satisfy demands would be to enforce the ban only within the old 12-mile limit.

On the general prospect for Norway's important pelagic fisheries, the meeting was warned of some difficult years.

Gunnar Soetersdal, Director of the Institute for Marine Research, said the immediate

outlook for species such as capelin, herring and mackerel was very gloomy.

He explained that the fishery scientists had taken a chance this year on predicting the main capelin migration. They had decided to concentrate research vessels on other areas needing their work. But the sad experience of the 1978 winter fishery had shown that a ship is needed all the time.

Migration

Russian scientists visiting Bergen at the end of April reported that the main migration of capelin was deep in the USSR sector.

According to the Norwegian Fisheries Directorate, the Russians have reported a winter capelin catch of 300,000 tons. Added to the Norwegian catch of 776,500 tons, this means that the total harvest was only about half that of the same period in 1977.

These figures will inform discussions of the Joint Norway-USSR fishery commission when it meets in

FRESH FISH FLIGHT PLAN

MARKETS in Europe may be able to get fresh fish from Canada a little fresher if plans of a Montreal-based agency are realised.

MIRCA is a federal-Quebec corporation promoting development at the new Mirabel International Airport north of Montreal. And, as part of this, it wants to introduce special flights from the Atlantic provinces connecting with Europe-bound flights leaving Mirabel.

Airliners

Fresh fish would be flown from the provinces in Canadian-designed Dash-7 short take-off and landing aircraft to Mirabel. There the fish would be quickly loaded in the large airliners.

In operation, the idea could bring fish caught in Canadian waters on a Tuesday to a Paris dinner table on Thursday.

Special handling facilities will have to be developed and agreement reached with several organisations. But a Paris bank and some Boston fish merchants are already reported to be showing interest.

Supplies must be bought

CANADA wants to sell more fish to Japan but has to convince the Japanese that they should buy from local processors rather than catch the fish themselves.

Canada's assistant deputy fisheries minister, David McEuchran, told Members of Parliament that the government has found that Japan often talks of increasing fish imports from Canada.

But in negotiations her proposals really meant the Japanese want to catch fish in the Canadian zone.

One Japanese firm has said that it is in the market for 300,000 tons of Canadian fish.

Rupee a slug in Sri Lanka

SRI LANKA has doubled its production of sea cucumbers (beche-de-mer) in the latest harvesting periods, reports *FNI* correspondent Nalin Wijesekera.

The 1977/78 season harvest amounted to about 800,500 lb.

The sea cucumbers (of the *Holothuria scabra* species) are taken by divers from the sea floor at depths from six to 20 metres. There are two periods of harvesting — January to May and August to October. An expert diver can collect an average of 500 animals which will fetch about one rupee a slug.

But, until the industry began to get popular in the earlier 1970s, local fishermen rejected the sea cucumber as an unclean animal. A fisherman touching one of them would immediately wash his hands.

Size graded

The industry is now being encouraged and harvesting has been opened to the private sector.

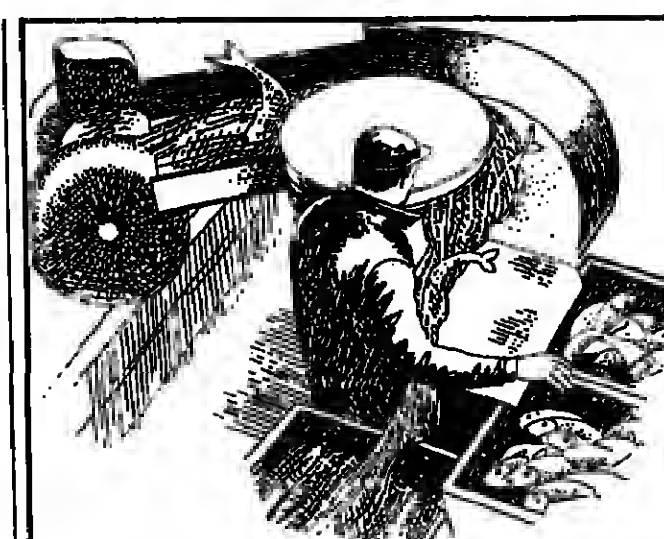
In Sri Lanka sea cucumbers are graded according to size and colour. The largest, measuring nearly nine inches, is classified SSFO. Then there are three intermediate grades down to the smallest of 1.5 inches.

There is no local market and so the entire production is presently shipped to Singapore. From there consignments go to China and Korea.

In shallow waters sea cucumbers can be taken using a steel-pronged fork mounted on a long handle. Divers in deeper water use spears and work from canoes or beech seine boats.

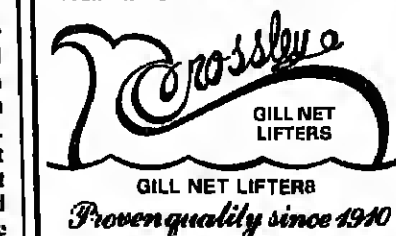
As the outer surface of the eel-like sea cucumber is heavily coated, this has first to be removed.

The conventional method involves boiling the animals and then burying them in loose wet sand on the beach for ten to 12 hours. By then the outer layer is loosened and can be easily removed. They are again boiled before drying.



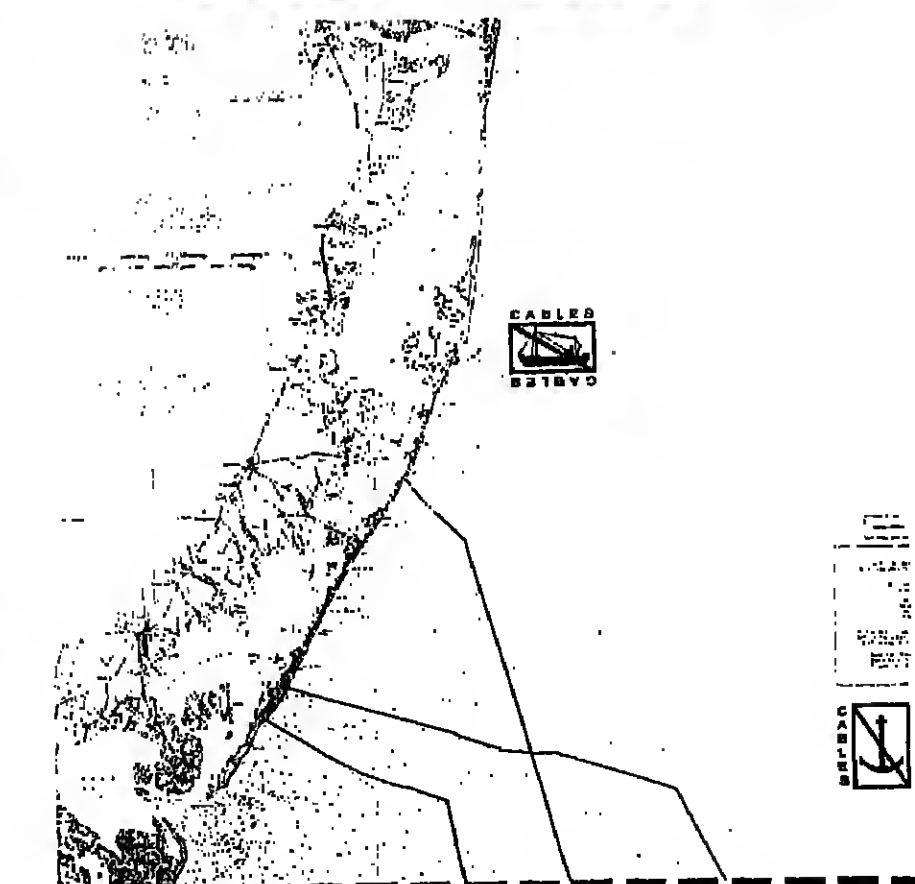
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Young fish farm trainees at work in the Highlands of Scotland. Could this be a way out for fishermen put out of work by depleted stocks and the failure of the EEC to reach a fisheries policy?

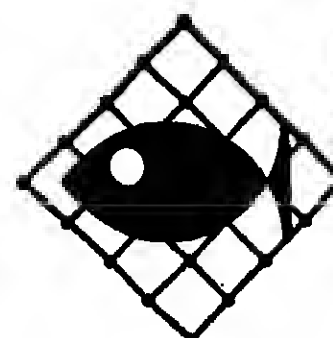
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London conference is told Little help for UK's shellfish growers

THE YEARLY conferences of the Shellfish Association of Great Britain have become so popular that this year there was a waiting list of people wanting to attend. The conference is held over two days in the Fishmongers Hall, London.

When these conferences began, the influence of the old oyster growers' association, which preceded the present body, was still apparent. But Director Gerald Gardner soon saw to it that interests were balanced between growers and canchors and among various species of molluscs and crustaceans.

Emphasis

Now the association seems to have moved into another phase, perhaps reflecting a world-wide trend. The emphasis is again on shellfish culture, but remains spread among species.

This shows that the association is reacting to the industry's needs. The exploitation of natural stocks has become more profitable for inshore fisheries and so their problems are less pressing. But culture still has a long way to go. Profits are marginal, problems of disease and feeding have still to be solved, and in the UK there is precious little official recognition or support.

This was underlined by the association's chairman, Cyril Lucas, in a hard-hitting paper on the Cultivation of Natural Stocks.

Mr. Lucas is a practical oyster cultivator with a wide knowledge of marine farming gained through travel and through his work with the association. This prompted him to compare attitudes in other countries with those in Britain.

He took as his examples



Cyril Lucas — he criticised shellfish anarchy in Britain

Japan, Holland, France and the United States. In these countries, he said, the coastal waters, with their food and recreational resources, were looked on as national assets to be protected and nurtured. But in the UK the situation was near to anarchy.

Obsession

The obsession with access which was born of Magna Carta fingers on preventing proper regulation by state or local authority.

Freedom, in this case, was incompatible with management and had led to stocks degenerating to a point where returns were no longer commercially interesting.

A change in the law is needed, he said. But until this



Laying down young oysters to grow in the sea trays of a farm in the British Channel Islands

is done why not give the responsible departments additional powers to develop fisheries in the public interest — perhaps to a point where investment could be attracted?

This applied particularly to protection and development of natural stocks and to introduction of exotic species.

By contrast, the conference heard from Professor John G. Riley how the "flooded coastline" of the state of Maine, USA, was crying out for marine farming. But there, too, the law could be crazy.

Under state laws it is illegal to "possess" undersized lobsters and this made it illegal to breed them for restocking purposes! But this had been done in Massachusetts for the past 20 years and in Maine a blind eye was turned to a programme of lobster rearing. This had produced saleable lobsters in only two years using water at 20 deg C but the cost of heating the water was half the total cost of the lobster.

Attended

The London conference was well attended by people from Holland, including shrimp expert Dr. R. Boddeke. Two associated papers described the progress made in mechanising the external cleaning and preparation of mussels for sale.

From France there was a film on the use of multi-element plastic spat collectors by the Maheo oyster fishery in Brittany.

Papers from British institutions included one from the Scottish Marine Laboratory in Aberdeen describing research into catching and cultivation of scallops.

Other papers dealt with feeding and problems of disease. Finally, an encouraging note was struck by C. H. Aldridge of the Highlands and Islands Development Board. He described a training course which concentrates on practical needs of fish farming. This will turn out young people trained to do the main work on farms. And, as one participant pointed out, it might help fishermen made redundant by EEC and other blights on fish hunting learn a new career.



Trays of oysters at an English farm in the south-west



Working mussel beds in Holland. The Dutch are major producers of mussels using culture and growing techniques. They show what might be done in Britain.

Herring block

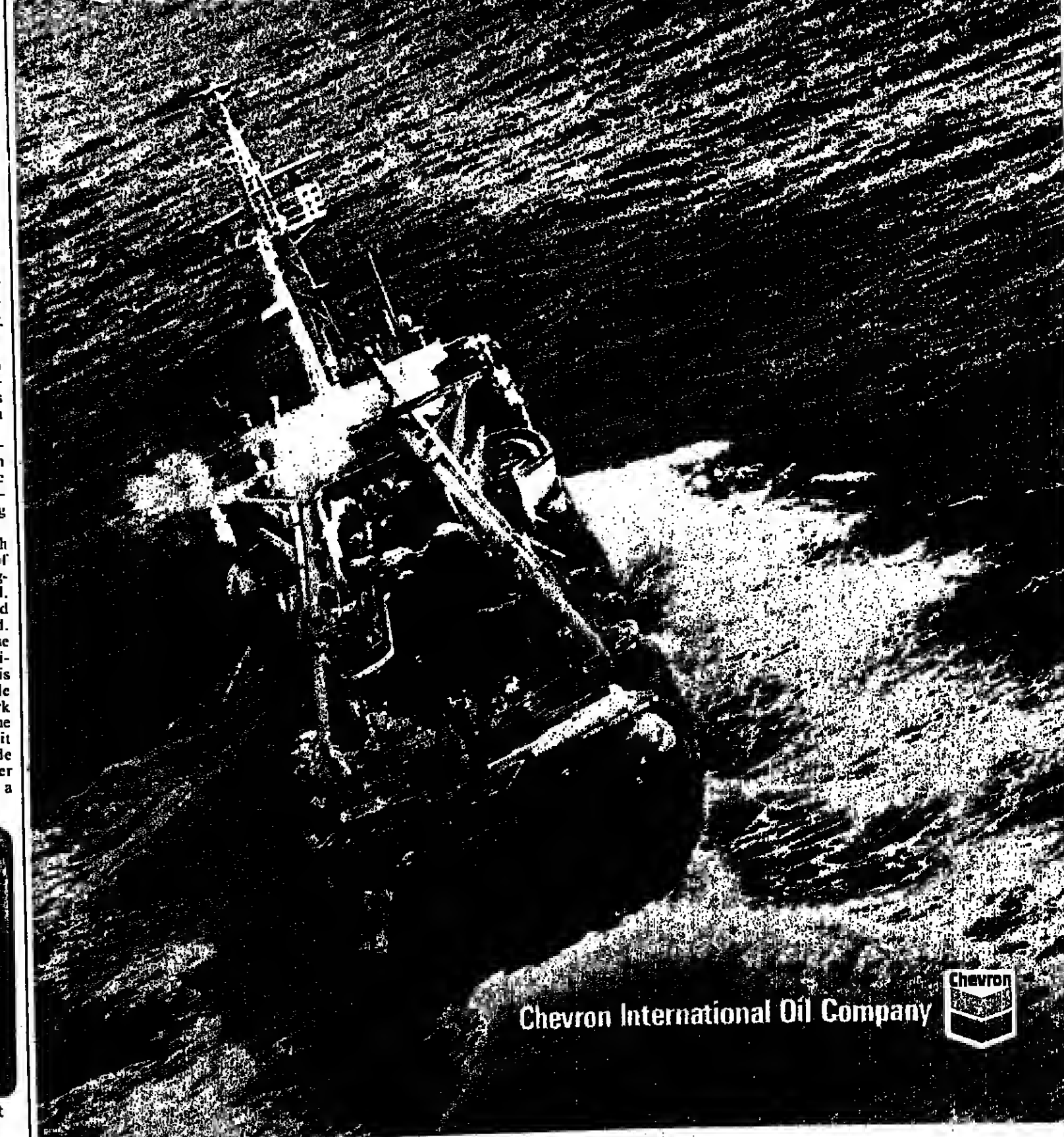
PROSPECTS are again bleak for even a small fishery based on Atlantic-Scandinavian herrings.

Last year a small harvest was allowed. But a report last month by marine biologists in the Institute of Marine Research in Bergen to Fisheries Regulating Committee says there is no basis for recommending any catch at all in 1978.

They have found no evidence of growth in spawning stocks and there may even have been a decline since 1977.

Acting on this advice, the Director of Fisheries has restricted herring fishing north of the 62nd parallel to bait and private consumption only.

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Tuna purse seiner: A ship such as this will have to pay Costa Rica a licence fee of \$60,000 to search for fish for 60 days.

The lady with the licences will collect from American owners

MEXICO MAY have given first warning of an impending tuna treaty revolt by Latin American states. But it was Costa Rica that struck the first blow to gain a larger share of the eastern tropical Pacific fishery.

Without warning, Costa Rica's new fleet of patrol vessels seized two United States tuna purse seiners and one Canada flag vessel on April 20. They were released five days later with the warning that there will be no more free fishing within Costa Rica's 200-mile limit.

Seizures

Foreign tuna ships will have to buy licences or face the consequences: seizures, fines and confiscation of catches.

Then, coinciding with the inauguration of the new President, Rodrigo Carazo, on May 9, Costa Rica denounced the Inter-American Tropical Tuna Commission treaty. She has threatened to withdraw from the eight-nation conservation organisation.

The withdrawal threat was not unexpected. But it comes with a new warning that Costa Rica will enforce licensing regulations strictly and with draconian penalties.

Particularly alarming to the US industry is the possibility that violations will lead not only to fines and loss of fish, but to prison for crews and confiscation of expensive ships.

President's Carazo's message was released in the USA by Dr. Gabriela S. Myers, Costa Rican consul general in San Diego where most of the fleet is based. She is also Costa Rican commissioner on the IATTC.

Every tuna ship, she said, will have to register in December, paying \$5 per net.

● THE People's Republic of Benin in West Africa has become the 18th country to join the International Commission for the Conservation of Atlantic Tuna (ICCAT).

Other members of ICCAT are Angola, Brazil, Canada, Cuba, France, Gabon, Ghana, Ivory Coast, Japan, Korea, Morocco, Portugal, Senegal, South Africa, Spain, United States, and the USSR.

TUNA THREAT

WILLIAM C. MILLER reports from San Diego on the latest threat to America's big fleet of tuna purse seiners

in the tough and very substantial tuna industry.

Costa Rica's new order requires tuna ship owners to go to her office and pay the licence fee when their vessels are on the high seas and approaching Costa Rican waters with the intention to fish. She then notifies her country that the vessels are licensed. Dr. Myers' doctorate was in international relations at the University of Southern California.

She said President Carazo is willing to negotiate the licensing fee schedule which she conceded is "excessive."

Asked what plans Costa Rica and Mexico have for reorganising the IATTC more to their advantage, she said they hope to reach an agreement at a meeting in July in Costa Rica with the other IATTC nations: the USA, Canada, France, Panama, Japan and Nicaragua.

Worth more

It is evident that neither Costa Rica nor Mexico wants to have the commission dismantled, as the yellowfin conservation programme is

worth more to them than to the USA.

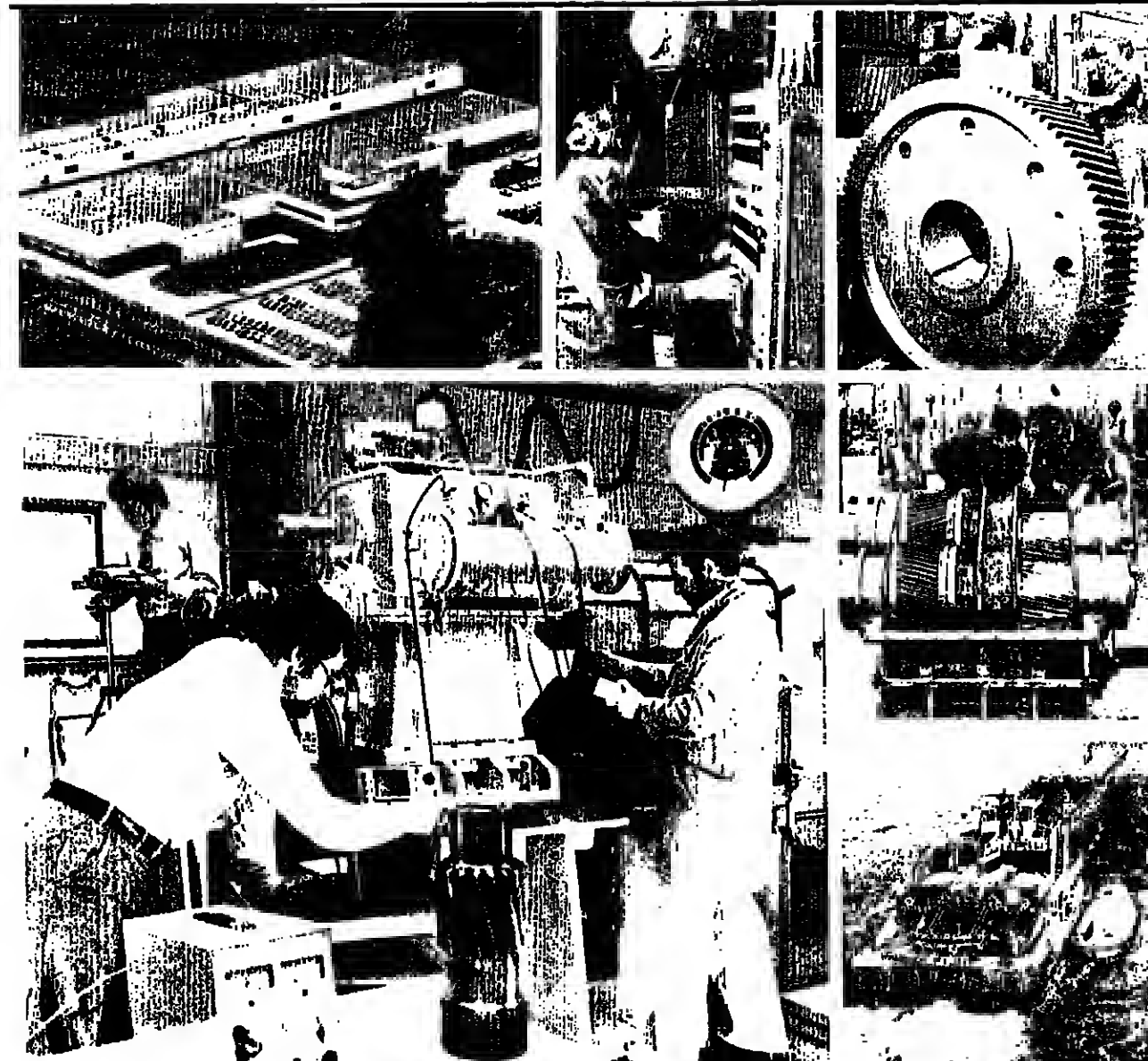
Without having to adhere to a quota in the Conservation Yellowfin Regulatory Area, the big American fleet could take much more tuna than its annual average of 70 per cent of the international fleet's catch — and leave much less for the others.

It is noteworthy that weeks before the Costa Rican seizure of the three tunaships (the Canadian vessel was the only one fishing at the time), Mexico had seized C118 Food's Crunch, later releasing it after payment of a \$17,000 fine.

Felando said the seizure was made because of "an apparent failure on the US side to provide an updated list to the Mexicans of regulations of ships to fish in Mexican waters."

Costa Rica with 19,653 square miles in area and two million population is a little smaller in size than the state of West Virginia and a little larger in population. In its voting laws it is incomparable: voting is compulsory. Nor has any US state the distinction of fronting on both the Atlantic and Pacific Oceans. The peaceful country has no standing army. But gunboats, yes.

If the US tuna industry doesn't like the new President, all it has to do is wait four years. Costa Rican presidents are limited by statute to one four-year term.



The result:

More safety

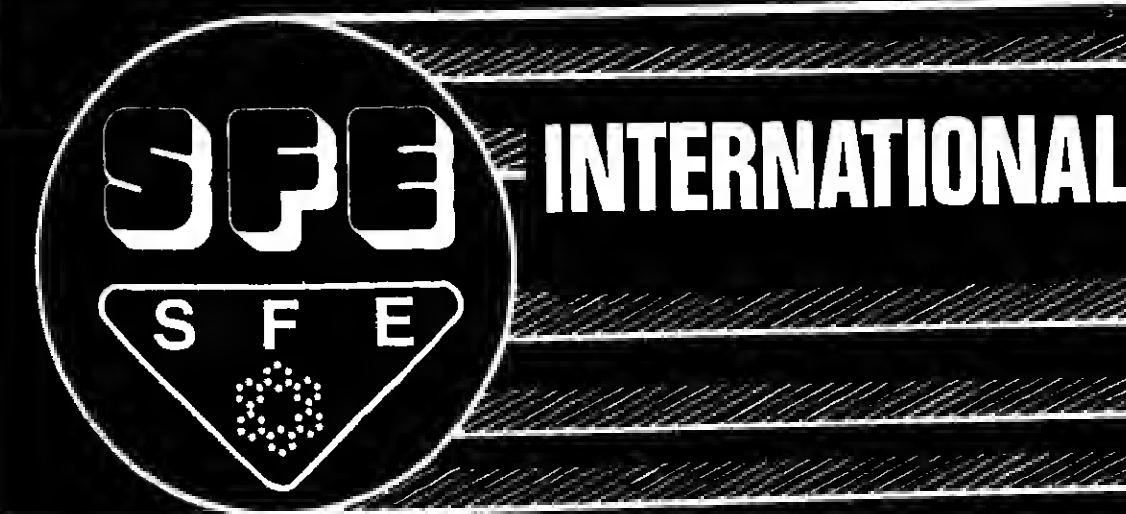
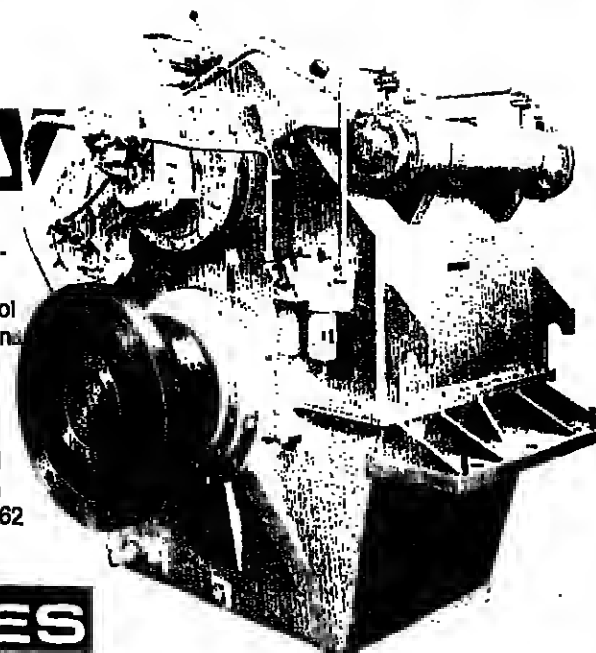
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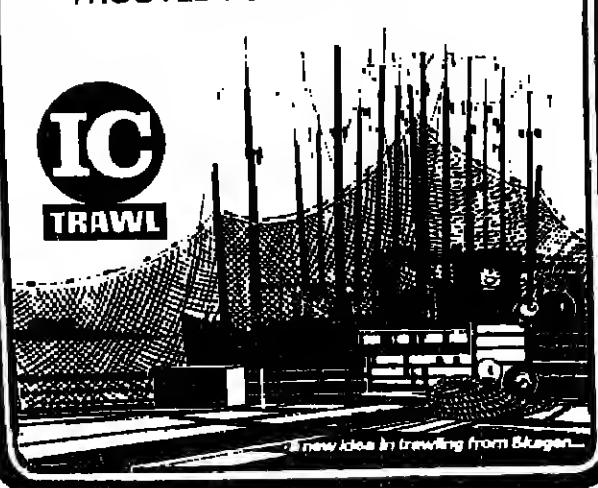
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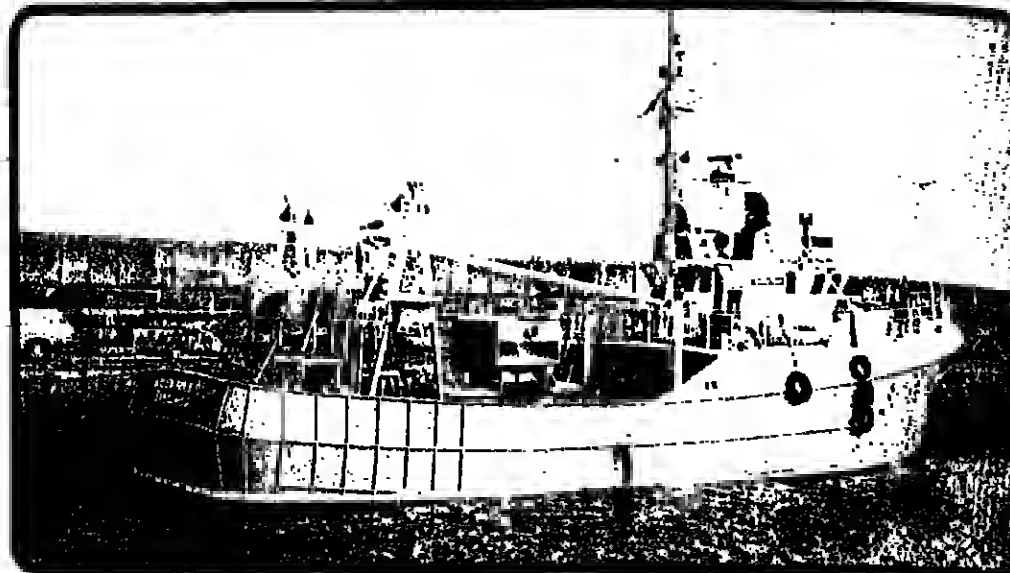
from the dockside

ONE SUNNY DAY last month — with the help of the White Fish Authority and a flock of small aeroplanes — the fishing town of Stornoway was invaded from all parts of Britain. For those far from Scotland, Stornoway is on the island of Lewis and Harris in the Outer Hebrides. It faces east to The Minch, where herrings once abounded and to the north and west is the North Atlantic where, in April and May, the hunt was on for a new fish bonanza.

At the risk of seeming repetitious, I have to say that this fish is the blue whiting. And the occasion was the unveiling by the WFA of the pioneering processing work being done on the species in the Rolf Olsen factory.

There are really two projects going on there. One is a continuation of earlier work on filleting the fish for introduction into the UK market. For this it has been essential to have suitable machines. In the factory, the 30 or so industry visitors were shown the first Baader 121 machine to have been actually purchased. Earlier models

had been in the plant, but these were prototypes on loan. With the 121, we might well look to a period of development of the species into a useful replacement of species such as cod and haddock as raw material for fish sticks and other products where taste is important but the fish does not have to be large and easily identifiable. But as we noted at length in May, the big project in



● "Green Isle II". She cannot match the huge hauls of the Norwegian catchers.

Stornoway is the test processing of blue whiting into surimi to make the kamaboko products that are food delicacies in Japan.

Incredibly, fish for surimi goes through about 12 stages of preparation. The first of these is heading and gutting in Swedish Areco CIS and CIF machines. Next in the small test plant, the cleaned and headed fish goes through a Baader 694 meat-bone separator. From then on the resemblance between surimi and western-style minced fish diminishes stage-by-stage.

So too does the taste, as judged by European palates. Most of the visitors said "Very nice" in a half-hearted way when asked to sample a few products from surimi. But it must do something for the fish-sensitive Japanese consumer, because this rubbery white substance that is made with such elaborate care is consumed in hundreds of thousands of tons.

In a later issue we shall deal in more detail with the process and with the fascinating tests that surimi has to go through before it is considered ready for test marketing.

This project is one more example of the usefulness to the British fishing industry of the WFA, its Industrial Development Unit in Hull, and its R & D links with organisations such as the Torry Research Station.

Chance inquiry

Apparently Japan's interest in blue whiting for surimi began with a chance inquiry and a brief visit by technicians of the big company Nippon Suisan. Then WFA chief engineer Mike Hatfield went to Japan and Nippon Suisan agreed to a pilot-scale operation.

Two of its executives — senior researcher Masahiro Makita and chief engineer of the machinery section, Hisashi Miyakawa — were working in the Olsen factory when we were there. The tests of the surimi have gone extremely well and a first consignment of 17 tons has been shipped to Japan for test marketing.

Meanwhile, with the 1978 spring fishing now over, the British industry is having to think hard about the catching vessels that will be needed and the area where the fish is most likely to be found if blue whiting moves up the popularity scale.

This year the Olsen factory was supplied for its test processing by those two outstanding skippers from Northern Ireland — Victor and Hayden Chambers — and their crews in the 87ft. (26.5 metre) long boats *Green Field* and *Green Isle II*.

These boats were chartered with skippers and crews and they came north after the mackerel fishing off the south-west of England. But, despite their 800hp engines, they are in a fishery which will probably be mainly the hunting phase of the big vessels. Skilled as they are, the crews of boats of this type cannot match the huge hauls taken by the much larger Norwegian vessels and supplied to the meal factories.

But if a food use grows, the price for blue whiting should follow and, with the help of machines such as the Baader 121, boats such as the *Green Field* could have another regular fishing opportunity.

Industry's debt

Once again I am reminded of the debt of the fishing industry world-wide to the genius of the founder of the Baader company, who died just as his ideas were becoming accepted.

One of the men who carried on with his work and made Baader a familiar word wherever fish is taken in sufficient amounts to require more than hand processing was Johann Jochim Diestel, who died in April at the age of 65.

He was Baader's son-in-law and was closely involved in the development of the Luebeck company's range of machines. He was also a familiar figure at major fishery conferences and exhibitions.

Jochim Diestel will live in the memories of many people, said the German fishery journal *AFZ* in a tribute. It noted that some 60 different types of Baader machines are being used in 55 countries. They are installed in all 27 of Germany's factory trawlers. Throughout the world they have been supplied to 850 vessels.

Peter Hjul



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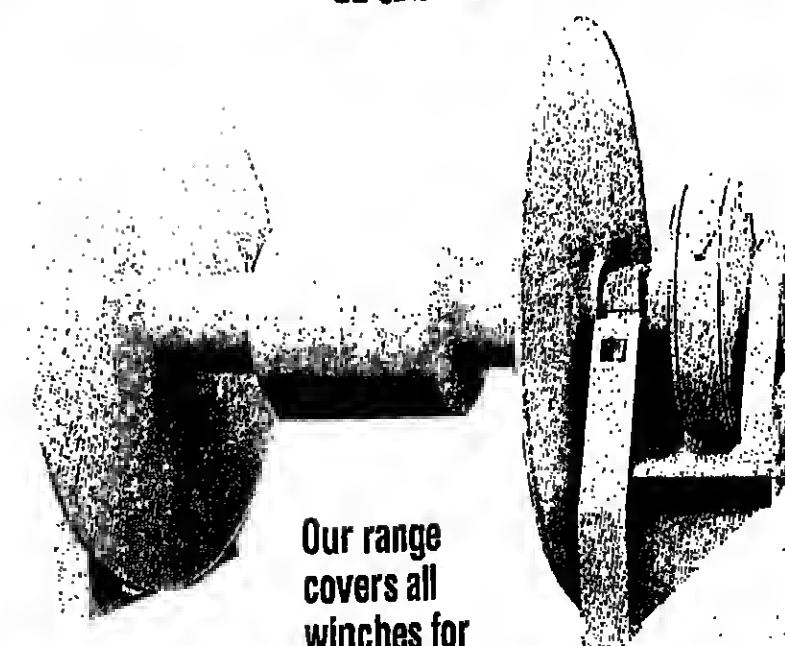
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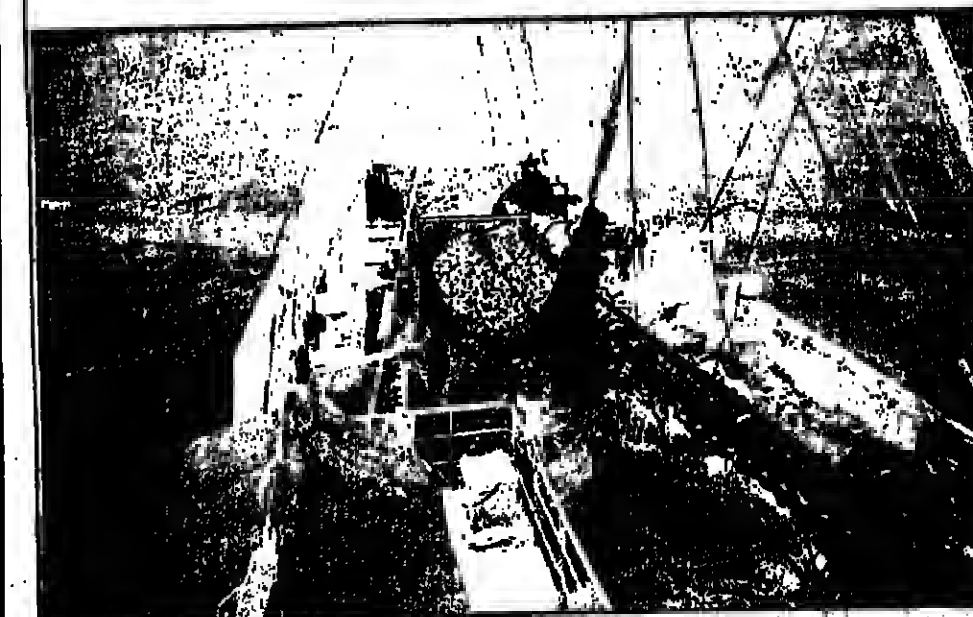


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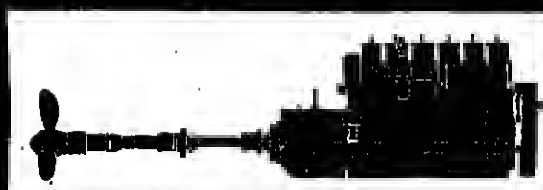


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SEA LAW AIMS ARE OVER AMBITIOUS

THE UN Law of the Sea Conference should abandon efforts to draft an all-inclusive treaty for its 130 nation members, and should instead adopt a "limited constitution of the oceans."

This is the view of Dr. William Nierenberg, director of Scripps Institution of Oceanography, La Jolla, California, and technical adviser to the US delegation at the Sea Law Conference.

Negotiated

"Nobody has ever negotiated a treaty with 130 nations. What they are trying to do is write a body of laws covering 70 per cent of the earth all in one swoop," Dr. Nierenberg said. "I don't see how it can be done."

He believes a four- or five-page constitution with broad language "could provide for a sort of league of oceans."

He said the goal of the conference is wrong, in that it is targeted too much on the rights of each nation to all the sea's riches.

Australia trawl ground discovery



Skipper Will Nicholls with his new vessel "Margaret Philippa." She could earn him \$34,000 a year.

THE DEFINING of two new deepwater grounds — one off the west coast of Tasmania and other off South Australia — with promising quantities of first class fish has encouraged a rush to build new trawlers and to convert existing vessels.

The grounds were found by two Commonwealth government chartered trawlers, *Zeehan* and *Craigmin*. Although the lengths of the trawl grounds are extensive, their width — in most areas over steep sections of the upper continental slope — is under half-a-mile in some places.

Interest in bottom trawling is also spreading to the Great Australian Bight where three former British Othello class stern freezer trawlers are working (See Page 28). They could be joined soon by smaller Australian trawlers, among them the 27-metre *Margaret Philippa*, launched in May at Port Adelaide in South Australia for the Nicholls family.

Double find triggers race for new vessels

Youngest

Skippering the new stern ramp trawler will be one of Australia's youngest and most successful trawlermen, Will Nicholls, aged 31. He started fishing as a deck hand on Queensland and northern Australian prawn trawlers, then completed a two year master fishermen's course at the St Johns, Newfoundland Fisheries College.

He has since skippered Australian tuna and prawn boats and brought to Australia one of three British side trawlers (*Saxon Onward*) for Southern Ocean Fish Processors.

Launching the *Margaret Philippa*, named after his mother, Dr. Margaret Nicholls, was the culmination of five years of planning by Skipper Nicholls.

While he was in England three years ago he bought a 600 hp Mirless Blackstone marine engine and stored it in Western Australia while he sought a trawler to install it in.

Finally he had plans drawn to his own specifications for a

200 gross ton trawler but had to call tenders on three occasions between 1973 and 1976 before he was able to get a contract. It went to Port Adelaide company, Kafi Boat Building and Repair Pty Ltd., owned and managed by Mr. Tony Franov, who migrated to Australia from Yugoslavia more than 20 years ago. The *Margaret Philippa* was the first steel trawler built by Mr. Franov but he has previously built 19 wooden tuna and prawn boats at the yard.

Price

Although the tender price was \$A635,000, by the time the vessel is fitted out for trawling it will have cost the family partnership more than \$A900,000.

The *Margaret Philippa* will carry mid-winter and bottom trawling gear and will fish in south-eastern and Great Australian Bight waters. It is equipped with a range of electronic fish finding and navigation equipment.

During 10-day voyages the catch will be stored in refrigerated and brine spray holds with a capacity of more than 100 tons.

Malta to start trawler fleet

MALTA'S prime minister Dom Mintoff has announced plans for a \$4 million fisheries project. This will be carried out with financial assistance from Kuwait and Libya and with technical help from FAO.

He told the Maltese Parliament that the project envisaged the creation of a fleet of 16 trawlers. This will be administered by a commercial company with crews working to the traditional system of profit sharing.

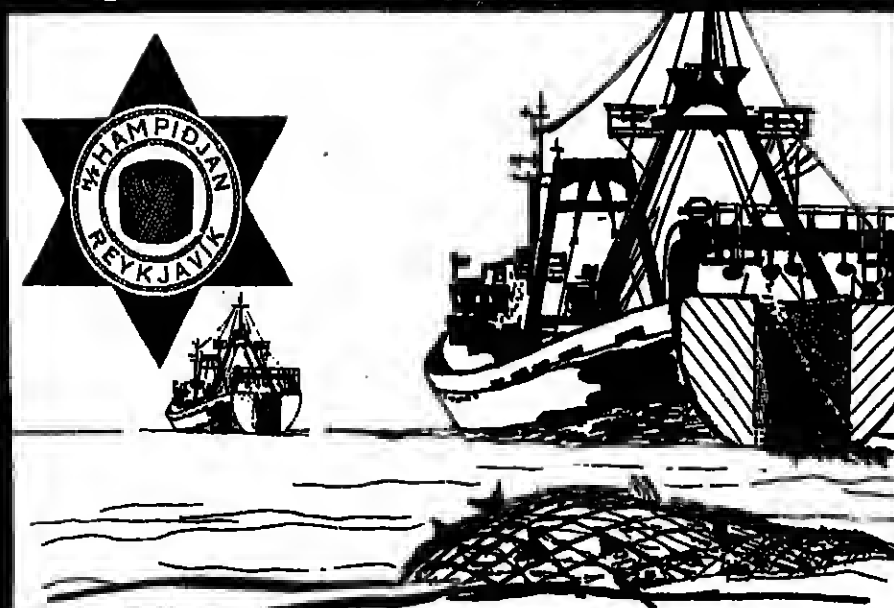
A loan of 1.2 million dollars (about £2m.) will be made available to Malta for the fleet by the Kuwaiti Fund for Arab Economic Development (KFAED). At three per cent interest, it will be repayable over 15 years with a grace period of five years.

He revealed that in April 1977, KFAED had agreed that FAO should be asked to study a Maltese project for a small trawler fleet.

The FAO report was submitted to Malta and to Kuwait at the end of July 1977. Following meetings between Maltese and Kuwaiti officials, its recommendations were accepted and an agreement was signed on April 30. This provided for eight trawlers.

Mr. Mintoff then said that Libya had been persuaded to match the Kuwaiti contribution. Thus the project grew into a 16-boat fleet to be managed by a joint Libyan-Maltese company.

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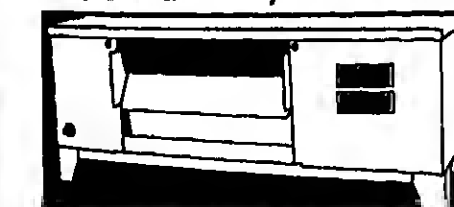


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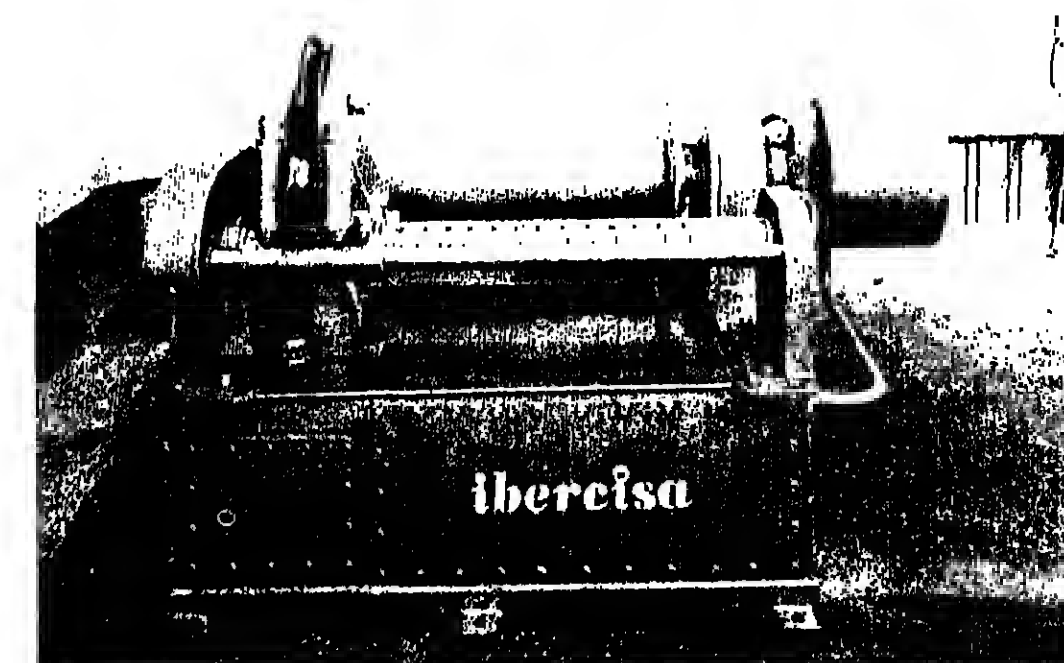
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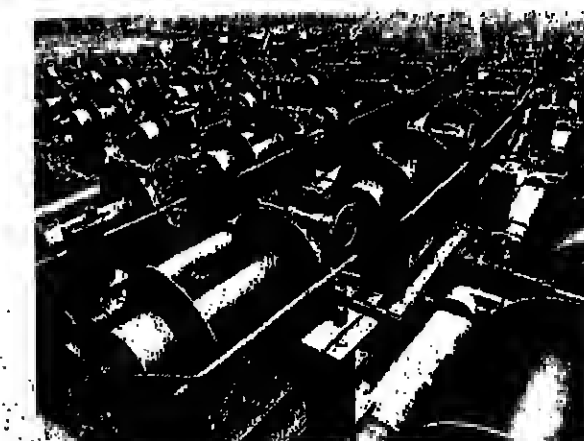
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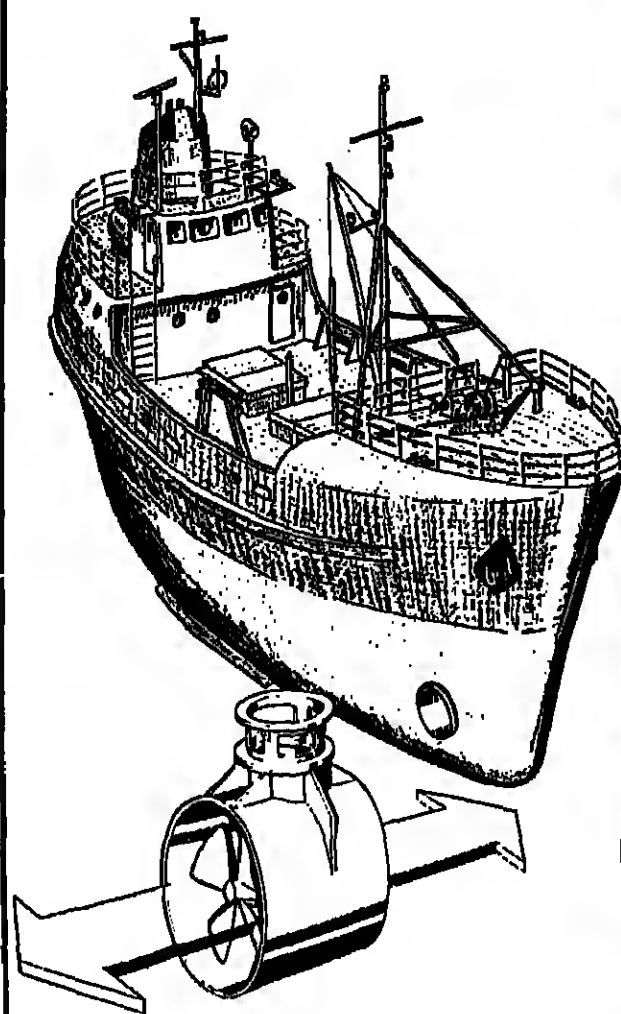
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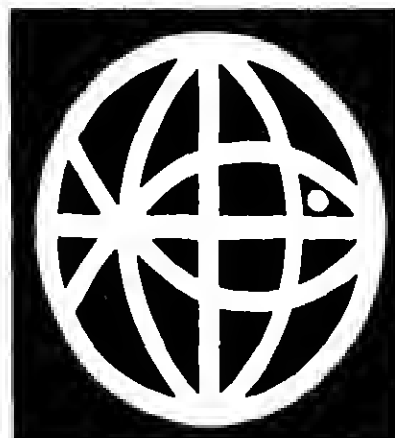
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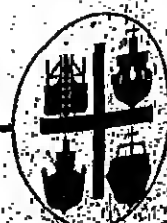
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Fundy boats earn more money

HERRING fishermen in the Bay of Fundy between Nova Scotia and New Brunswick have been complimented by Canada's Minister of Fisheries Romeo LeBlanc for organising their catch to dramatically improve their livelihood.

Part of this improvement is due to a contract the fishermen have had with Poland.

Three years ago they were selling 80 per cent of their herrings for reduction to meal at only 25 dollars a ton. Now it goes mainly for food at 160 dollars a ton and up.

Boat quotas

With federal government help, the Bay of Fundy fishermen took over company-owned boats. They then arranged individual boat quotas to ensure that all got a fair share of the fish available, and they negotiated to sell herrings directly to Polish factory ships for about 120 dollars a ton. Now Canadian processors are bidding competitively, and Minister LeBlanc is advising fishermen elsewhere to learn from the Fundy men.

THE Fishermen's Co-operation Society in Pakistan earned Rs.148 million (about 18 million) last year for 26,900 metric tons of fish.

From this, the Society's net commission income was Rs.4.48 m. and it spent Rs.3.5 m. providing nylon twines, nets and other fishing gear, and parts for boats and engines for its members.

LING LINERS MOVE OUT

FOR Swedish devotees of the Christmas spillanga or lutefisk, there is the prospect of some supplies from catches of ling taken by local boats.

Fishing for ling in Shetland waters and the wider Atlantic Ocean is one of the many traditional activities that have been giving way as limits have spread out and controls have tightened.

The ling wanted by the Swedish line boats is in EEC waters and for some time it was doubtful if any quota would be allowed.

Last year, the one boat that ventured out got itself arrested and taken to Lerwick in Shetland by a Scottish patrol vessel. After some argument and a clearing up of misunderstandings, the boat was released.

This year, three boats will be able to fish in the area. This, apparently, was so unexpected that the boat's owners had trouble finding mackerel to use as bait.

The Norwegians did not believe there would be a Swedish ling fishery in 1978 and so they sold the mackerel.

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JAPANESE BUY INTO FISH FIRMS ON CANADA'S WEST COAST

THE JAPANESE have been legally circumventing Canada's 200-mile economic zone by buying into Canadian companies or by lending working capital.

After gaining partial control of the industry in British Columbia, it is alleged, reports *FN* correspondent Les Rimes, that they were able to dictate the disposition of 70,000 tons of roe herring taken this year off the BC coast.

Some Japanese companies were so eager to get a foothold in the roe herring market that they bid as high as \$1,000 a ton. The average sale brought in \$300 a ton.

Although fewer fish were caught in 1978 — 70,000 tons compared with 81,000 tons — the inflated values gave fishermen \$56 million, which was well over double their earnings of 1977.

Purse seiners averaged \$109,000 a boat during the short herring roe season lasting about a month.

Fisheries economist Dr. Chris Newton has estimated the total processed value of the herrings at \$101 million.

The main reason for the inflated prices is that Japanese buyers were so keen to get a share of the fish that they pushed up their bids; they bought into smaller Canadian companies, and they lent working capital.

Canadian companies are worried about these tactics because they find it increasingly difficult to match the bids of the Japanese buyers.

Anchovy glut cuts prices

AN UNUSUAL glut of anchovy (known in the Philippines as dilis) recently flooded the markets of Davao and other places along the coast of Sarangani Bay in southern Mindanao. It quickly brought down the price of the fish from 4.5 pesos to only one peso a kilo (about 12.5 pesos equal £1). The price in Manila is usually around 12 pesos a kilo.

During peak days of the glut, anchovy were taken in water only one metre deep by beach seines. Even the gatherers of milkfish fry for fish m-m-growing diverted their nets to anchovy catching.

The rush of the small fish had other effects in the area. There was soon a shortage of salt as buyers tried to preserve as much as they could. And paraffin (kerosene) cans to hold the salted fish jumped from 2.5 pesos to eight pesos each.

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MPs' STUDY REVEALS AN INDUSTRY WELL WORTH SUPPORTING

THE REPORT

THE FINAL report of the Expenditure Committee on the UK fishing industry covers 90 pages. In the first part it looks at the fish resources around the British Isles and their conservation. It then considers the structure of the industry, with sections on catching, marketing, employment and earnings, statutory organisations and ports.

There is a section on the Common Fisheries Policy of the EEC. The next section on the control of competition looks at systems of control of fishing waters and at enforcement of conservation regulations.

Under the heading "Miscellaneous problems," the report deals with safety regulations for inshore vessels and damage to fishing from oil activity in the North Sea.

Finally, it looks to the future and suggests what might be done to slow down the contraction of the fleet and to keep fishing as a viable part of the British food economy.

THE ESSENTIAL facts confronting the British fishing industry today are the sharp decline in resources, overcapacity in the fleets competing for access to these resources, denial of UK access to some important traditional fishing grounds, and acute competition in others.

Although surrounded by some of the richest fishing waters in the world, the industry has been going through a period of acute difficulty, and there seems to be no ready and quick solution to its many problems. This is the one, strong but unexpressed conclusion that comes out of the report of a Parliamentary committee

which has been looking into British fishing over a period of nearly 18 months.

The investigation was by the industry sub-committee of the Expenditure Committee of the House of Commons. Under the chairmanship of Dr. Edmund Marshall, an all-party group of ten MPs listened to more than 300 people give their opinions of fish resources and British fishing.

They considered the evidence set out in some 450 documents; they visited fishing ports all the way north to the Shetland Islands and south-west to Bristol; they flew in a Nimrod aircraft, and they went over to Norway and Iceland to look at the fishery industries there in relation to the UK.

From all the torrent of information and opinions the sub-committee distilled a short preliminary report which touched mainly on fishery protection and was issued in 1977, and a final report released last month.

To an industry looking anxiously for answers, the report proposes little beyond what is already being done. But it does uphold the industry appeal for a British 50-mile limit that will even exclude the vessels of Britain's EEC partners. It also reflects the industry disillusionment with EEC fishery negotiations by suggesting that Britain may have to go it alone in arranging reciprocal fishing rights with Norway.

What the report does reveal is an industry not quite in the purious state described by some of its most eloquent pleaders for government help, but still needing support and some intelligent direction.



Looking to the future, the report first reviews the experiences of the past few years. Total landings by UK vessels rose from 869,000 metric tons in 1975 to 933,000 tons in 1976, but then fell to around 900,000 tons in 1977. These landings earned £152 million in 1975, £210m. in 1976, and £251m. in 1977. But the figures conceal the difficulties of some sections of the industry, notably the distant water ports which have suffered most from the loss of grounds to 200-mile limits off Iceland and Norway, and catchers and processors suffering from the loss of herrings.

The Expenditure Committee sees no easy solution for either of these sectors. But it suggests that for herring processors, the problem may be a temporary one. It refers to the first signs of recovery of the Atlantic-Scandinavian herring in the Norwegian Sea. If North Sea stocks are rested sufficiently, "there seems no reason why they too should not recover, although we have been advised that this may take as long as ten years."

Blue whiting fishing and processing may help those who can adapt to it and there are possibilities in the growing market for smoked mackerel, but in general the immediate outlook in the herring sectors bleak. The problem is not only a UK one and the Committee suggests there is a case for EEC assistance to tide over the lean years until supplies are restored.



Looking at the distant water fleet, the Committee sees its predicament as one aspect of the whole problem of increased capacity leading to over fishing and hence to declining stocks. This decline, and the related recognition of the need for conservation, coincided with the world-wide move towards 200-mile limits which has excluded UK fishermen from traditional outside grounds and increased the competition in those still left.

In considering policy to deal with this situation, the Committee sees effective conservation as the single overriding consideration.

"If this fails," the report warns, "there will be no fish to catch and arguments about sharing the catch will lose all meaning."

Quotas are one means of conservation, but it emphatically supports the view of Fisheries Minister John Silkin that "catch quotas with limitation of effort are totally unacceptable."

After noting that reduction of total fishing effort in waters open to British fishing may on conservation grounds amount to 30 or 40 per cent, the Committee sees little prospect of this situation being soon alleviated. But it does urge the government "to continue to strive by any available means" to secure renewed access for UK fishermen to grounds off Iceland and Norway.

The industry, for its part, should pursue more energetically than it has done in the past the possibilities of new species and unfamiliar waters. These might be in the South Atlantic or nearer home in deep water to the west. The efforts made could help to disprove the pessimism of one witness who said that the distant water fishery is now the dying side of the industry.

But even if all the possibilities materialise, "we cannot escape the conclusion" that over the next few years the contraction of the fleet will continue. While the pace and extent of the contraction will be largely a matter for commercial judgment, the government and the EEC can seek to influence it by giving or withholding grants for

What the MPs recommend

Among the main recommendations and observations of the report on British fishing were:

- ① High priority for R & D work on blue whiting.
- ① Look again at fishing for deep-water species.
- ① 50-mile fishing zone may be justified.
- ① Bilateral negotiations with Norway.
- ① Fish farm laws should be clarified.
- ① The WFA and HIB should continue.
- ① Relax ban on Icelandic landings.
- ① Encourage pink shrimp industry.
- ① Consider home market for squid.
- ① Explore South Atlantic fisheries.
- ① Develop line fishing.
- ① Consider fishing Training Board.
- ① Supplement catch quotas by effort control.

various forms of restructuring. The Committee did not consider it necessary to argue in detail the case for preserving a viable UK fishing industry.



"Even in the present phase of declining stocks," says the report, "there are still fish to be caught, the food is needed, and there is every reason why the skilled and experienced UK industry should play a large part in catching them."

"With careful management, moreover, stocks should recover and we may hope that they will one day support the British Fishing Federation's optimistic forecast of 1.5 to 2

million ton UK catch. It is important that the necessary skills and experience should be kept in being against that day, particularly in the light of forecasts of food shortages arising from the increasing dependence of farming on imported energy. In social and human terms, there are local communities which must not be allowed to wither.

"We conclude that the policy of the government for the next few years should be to take, and press others to take, every possible step to arrest the decline and to speed the recovery of stocks; to encourage the industry to exploit new resources; and meanwhile to cushion the impact of the inevitable contraction in a way which makes for efficiency, provides for eventual re-expansion, and safeguards the existence of communities for which fishing is their life-blood."

"It is essential that this policy be pursued with full awareness of the importance to the United Kingdom of a viable fishing industry."

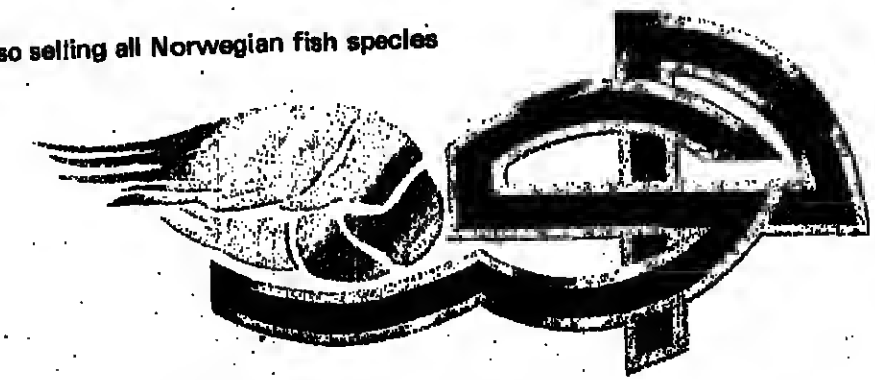


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MPs LASH OUT AT EEC FISH POLICY

WHATEVER the merits or otherwise of UK membership of the EEC, the Parliamentary committee agreed "with the virtually unanimous view of witnesses" that the effects of the Community's Common Fisheries Policy have so far been bad for the British fishing industry.

The basic causes of UK dissatisfaction can be briefly stated. UK fishermen and their government both believed that Britain faced up to the problem of declining stocks through heavy fishing much more urgently and effectively than had others.

They had acted to conserve stocks by restricting effort while other countries had continued to over-fish.

focus on Britain...

In general, the drastic restriction of effort kept fish stocks within what were then British waters at a level above those of other EEC countries, which had been dangerously depleted. The report notes the view of the Fisheries Departments that over-fishing had been caused by the very rapid growth of fishing industries in other countries.

Central to the whole argument is the fact, admitted by the EEC Commission, that between 55 and 60 per cent. of the resources of all Community members lie within the

United Kingdom's 200-mile limit.

"Unless therefore the UK is allocated a comparable proportion of the Community catch," the report continues, "the UK fishing industry will suffer."

"A Common Fisheries Policy based on equal access of all fishing fleets within the EEC to the waters of all EEC countries (the concept of the Common Pool) must be massively disadvantageous to the UK. We do not think that the Commission attached adequate importance to this obvious truth, or to the fact that the UK was the main net loser from the establishment of 200-mile zones by non-EEC states."

Faced with this, the British government began a sustained effort to secure improvement of the CFP in three main ways:

- 1 By the allocation to the UK of a proportion of the Total Allowable Catch (TAC) which should bear a reasonable relation to her contribution and also recognise her losses in third-country waters.
 - 2 By imposing control of fishing effort in addition to quotas.
 - 3 By excluding from the "equal access" provisions a wide belt of coastal water within which the coastal state would have full control and authority.
- At the same time, the government pressed for the adoption of some urgent conservation controls, to the point of introducing unilateral measures.

So far, Britain and her EEC partners have failed to reach agreement and so the recommendations of the influential Expenditure Committee could have an influence on negotiations.

One of these concerns relations with Norway. When it visited Norway, the members of its sub-committee gained the impression that, while the Norwegians were not willing to negotiate bilaterally with each member of the EEC, they would not rule out the possibility of doing so with the UK, since each party could potentially satisfy the other's requirements.

In its other conclusions and recommendations, the report finds that the government has been fully justified in defending vital national fishery interests with some obduracy. It recommends further that it should be the objective of UK policy to secure agreement that each EEC member state should have exclusive access to a 50-mile wide zone from its own coasts.

endorses this view. It recommends that an effective EEC licensing system should be worked out in detail and it adds that this might "considerably lessen the possibilities of abuse attendant upon any quota system."

Enforcing a licensing system will be more difficult within the framework of the EEC than within the framework of a single country. "As stated in evidence, fishing in our 200-mile limit is a much more complex operation than in other states' waters, and to introduce licensing controls for a fishery as mixed as that which takes place in the North Sea and the Channel introduces a totally new dimension of control and regulation."

"Nevertheless, as was pointed out in other evidence, cancellation of the licence of a boat would be an effective penalty even if there were to be no other penalties for violations of agreed measures. However, for infringements of net-mesh size regulations we think the appropriate penalty should invariably involve confiscation of the offending nets."

Apart from its view that the EEC proposals are unfair, the British industry has consistently objected to catch quotas as a sole means of controlling competition and promotion conservation of stocks. It feels, like Dr. Owen, that quotas must be accompanied by an effective licensing system, and a protective belt around the coast.

On the basis of the evidence, the Expenditure Committee report,

Good job by the WFA

TWO organisations unique to the British fishing industry and whose future has been in doubt have gained the influential support of the Expenditure Committee. The White Fish Authority and the Herring Industry Board were set up by Act of Parliament to serve their respective sections of British fisheries.

In its report, the Committee noted that opinions on the usefulness of the two bodies varied. But it had the impression that those who knew most about them were the most appreciative.

Its sub-committee investigating the industry was impressed by what it saw both of the WFA's Industrial Development Unit in Hull and of its numerous publications dealing with fishery technology and economics. It considered that the services were provided for the industry at remarkably low cost.

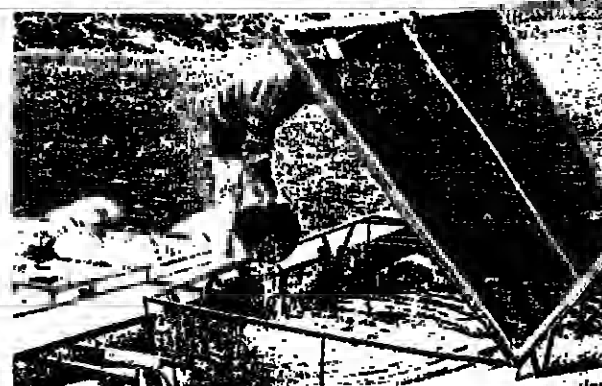
"We think both these bodies deserve continued support and encouragement," says the report.

focus on Britain...

When it considered fish farming in the UK, the sub-committee also came out on the side of the WFA.

One witness, the report notes, suggested that the farming of turbot and sole would never be commercially viable. But the chief technical officer of the WFA had said firmly that, although it was not presently economic, studies and trials indicated that it was on the road to becoming so. Evidence from the WFA had elaborated the arguments. Some large firms were showing interest and preparing to make major investments.

From all that it learnt, the sub-committee was sufficiently impressed to have the report recommend that the government support for turbot and sole rearing be maintained at least at the present level of £400,000 a year. And it added that "what we understand to be an increasing demand for R&D on salmonid rearing should not be at the expense of this work."



Turbot feeding in White Fish Authority cages in Scotland. Work on marina fish should continue.



A British purse seiner at work. Raising mackerel does not save them.

Hope for cod and fears for mackerel

EXAMINING the state of British fish harvesting, the Expenditure Committee considers the scientific evidence for an improvement in long term yields of cod "to be particularly strong." The improvement would flow from the use of a recommended minimum mesh of 90mm and the consequential release of more young fish.

Other stocks such as haddock, plaice and sole would also benefit.

Most of the well-known species in heavily worked areas appear to need protection and the report concentrates on ways of providing this.

There are even problems over some of the newer fisheries. Thus the report expresses concern over the state of the mackerel stock fished off the south-west of England. There should be no relaxation of conservation measures.

The sub-committee appeared to be particularly worried over the lack of control over the dumping of catches at sea and over the transhipment of fish to factory ships.

It noted allegations that fish were released at sea by the larger ships, if they were not of the size or quality required. And it said it had been told in evidence that most species taken on board a trawler or a purse seiner will almost certainly die.

Suffocate

In Iceland and Norway, the sub-committee had been told that, even if the fish are left in the sea, most of them probably suffocate. Even if a purse seine is opened in time to release the fish alive, in the case of mackerel, "95 per cent. of them probably die."

While cautious about the figure of 95 per cent., a British research director had agreed that "there is now a body of evidence that believes that mackerel, if kept in a purse seine or mid-water trawl and then released, will die."

From all it heard, the sub-committee was convinced that a ban on discarding at sea is an essential conservation measure.

It then makes an interesting

Focus on Britain...

suggestion: "If discarding (other than for safety and any other permissible reason) were made a breach of the licence, rather than an offence against a law of general application, the ban could be confined to times and selected fisheries where quotas are in question and discarding is significantly damaging to the stock."

"Even though total enforcement cannot be guaranteed, it should be possible to provide enough policing effort to make selection likely enough, when coupled with the threat of loss of licence, to constitute an effective deterrent. We recommend that this should be done."

On transhipment of mackerel catches, the report accepted the view that it provides useful alternative markets. But it found the evidence too weighty to be ignored claiming that control is inadequate and that this led to quotas being exceeded.

It should be technically possible for transhipped catches to be carefully checked. "If the UK Inspectorate lacks the resources of legal powers to enable it to do this, we recommend that these be provided."

IN BRIEF

● **DESPITE** the disadvantages of deepwater working and the difficulty of marketing unfamiliar species, the report supports the view that further exploratory work on deepwater species such as grenadiers and blue ling might be justifiable.

● **THE** sub-committee was concerned that many fishermen have never learnt to swim. It recommended that steps should be taken to make it obligatory for any person starting sea-going employment in fishing from January 1980 to have a basic swimming and life-saving certificate.

● **TQ MEET** the needs of Scottish fishermen, there is a case for instituting a degree course at Aberdeen University. There should be scope for useful cross-fertilisation between such a faculty and the two Aberdeen fisheries laboratories.

● **ALTHOUGH** there are considerable crab stocks off parts of the UK, many are not exploited mainly because of lack of processing plants. It is suggested that government assistance will be required to get crab fisheries going. But the report does not recommend special assistance beyond that already available through such bodies as the WFA.

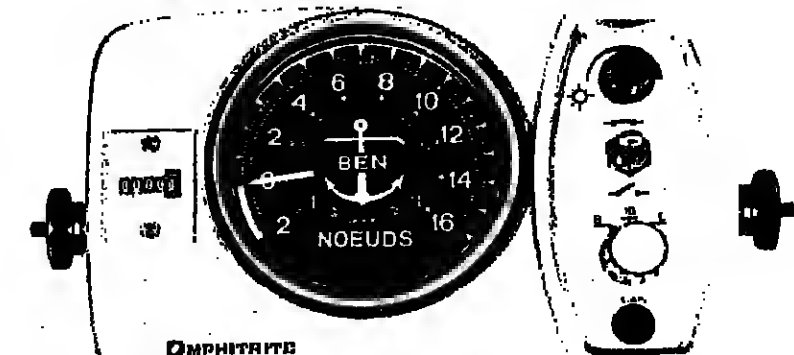
● **FEW** squid are eaten in Britain outside a few specialised restaurants, but they are often sampled by British holidaymakers in Spain, Portugal and the Mediterranean countries. There are good squid resources off the UK and the report notes the possibility of developing a home market.

● **LARGE** amounts of unwanted or undersized fish are often caught and discarded at sea. The report recommends that these undersized fish, most of which will not survive when thrown back, should be brought ashore and converted to meal.



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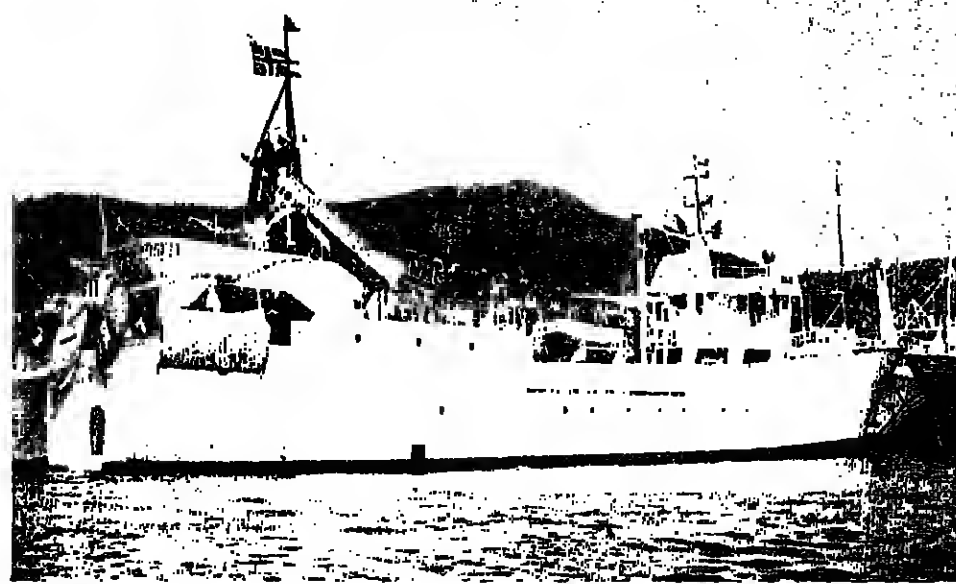
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BRITAIN JOINS RUSH FOR



India's offshore resources have been surveyed by stern trawlers such as the Norwegian-built Rastrelliger.

THERE IS considerable scope for technical co-operation between British shipbuilders and Indian yards in the design and construction of fishing vessels. This was the conclusion, and the parting message, of a six-man mission from the United Kingdom which visited India last month.

The mission represented British builders and repairers and the White Fish Authority. It called on yards, saw sections of the fishing industry, and had talks with state and central government officials, fishing vessel operators, and some of the large business houses now moving into the industry.

It also held seminars in Bombay, Calcutta, Cochin, Delhi, Hyderabad and Madras. These were arranged in collaboration with Global Imex, a leading export-import house and sole concessionaires of British Ship Builders and Ship Repairers and Ship Builders Independent Association (SSIA) in India.

INDIA 1

During their discussions, the mission covered the supply of trawlers from 20 metres upwards, co-operation in the local construction of fishing craft, training of crews and shore executive staff, and the supply of catching and processing equipment.

At the end of the visit, the mission leader, Mr. A. M. Macdonald, said Britain could offer consultancy services to Indian yards because she had developed very advanced technical expertise in the fishing industry.

Training centres

The government of West Bengal was interested in setting up training centres with the help of British experts. The team had also found scope for consultancy aid in Tamil Nadu, and fruitful co-operation seemed possible at a technical level in Kerala and Maharashtra.

India, he explained, could buy trawlers from

INDIAN TRAWLER ORDERS

Britain as a first step towards establishing building facilities with British financial and technical support.

Processing and distributing fish products were other fields in which Britain could assist India.

Speaking in Bombay, Mr. Macdonald said: "We are interested not only in selling trawlers, but in the whole range of fishing operations, right from catching the fish to marketing it."

Another member of the mission, Mr. M. Hatfield of the White Fish Authority, said during the Bombay seminar that his "first impression" was that India should stop buying trawlers in an "uncontrolled and unorganised" way. Her industry should study the potential of fish resources and economics of fish catching and processing and then decide on the most suitable operations.

He was, he added, ready to return to organise studies and surveys.

Commenting on India's prospects in large-scale fishing, the *Economic Times* of New Delhi noted the entry into the industry of a number of big business houses. The Ministry of Agriculture, it said, had rightly projected that about 175 vessels for deeper waters should be commissioned yearly over the next ten

years. Because Indian yards did not have the capacity, the government had already approved the import of 100 vessels.

It then warned against a "powerful foreign trawler lobby" which has made its appearance in New Delhi.

"Because of the worldwide recession in the shipping industry," says the *Economic Times*, "agents of foreign shipping interests are willing to offer trawlers on lucrative terms. The government would be wise not to succumb to the pressures of such foreign lobbies and even take steps to curb their activities."

Studies needed

"Regrettably, no serious studies seem to have been conducted yet to determine the type of trawlers required for economic operations in our waters. Nor have we taken enough steps to determine the location, size and type of fish shoals in mid-ocean. There is also the need to find economic ways of handling, preserving, utilising and marketing marine fish and to train personnel in the problems of deepsea fishing."

"Based on such studies, we should be able to develop trawlers of standard design and specifications suited to our conditions."

The Ministry of Shipping and Transport and the country's 36 boatbuilding yards oppose the import of trawlers, claiming that India has the capability to build them. It is, however, generally admitted that facilities to manufacture fishing gear machinery have still to be established in the country.

"What is more," says the paper, "most indigenous trawlers do not include the latest technological improvements: their prices are very high and after-sales service poor. There are also delays in delivery. Hence, import of trawlers may be necessary, but on a restricted scale, until we develop our own capability."

The paper speaks of "hectic canvassing" in New Delhi by the representatives of foreign trawler builders among prospective Indian customers.

Under the present scheme of financing trawler imports a licensee gets a loan from the Shipping Development Fund Committee (SDFC) up to 95 per cent of the cost of an imported trawler while he has to find the remaining five per cent.

Agents are reportedly offering them price

"adjustments" which eliminate payment of even this five per cent by the purchaser.

The Government initially arranged to import 30 trawlers from Mexico mainly for shrimp. "In the face of a campaign mounted against the Mexican trawlers the Government apparently decided to leave further imports to private parties," the paper concludes.

Now association

Meanwhile, medium and small shipbuilders in the private sector have teamed up to form an association which will safeguard their interests.

The initiative for this move came from Bombay. The president of the new organisation is Mr. E. H. Lala, of Modern Mechanical and Marine Works, and its secretary is Mr. V. Kumar of Bharati Shipyard.

A spokesman of the association told *Marine Times* of Bombay that the first issue it proposed to take up was to protest against the Indian government's policy of permitting liberal imports of trawlers.

INDIA 2

Open for the big spenders

THE INDIAN government will not bar any large business house from moving into the deepsea fishing industry as this was a capital intensive undertaking. But the interests of small fishermen will be safeguarded, Agriculture Minister Surjit Singh Barnala told Parliament.

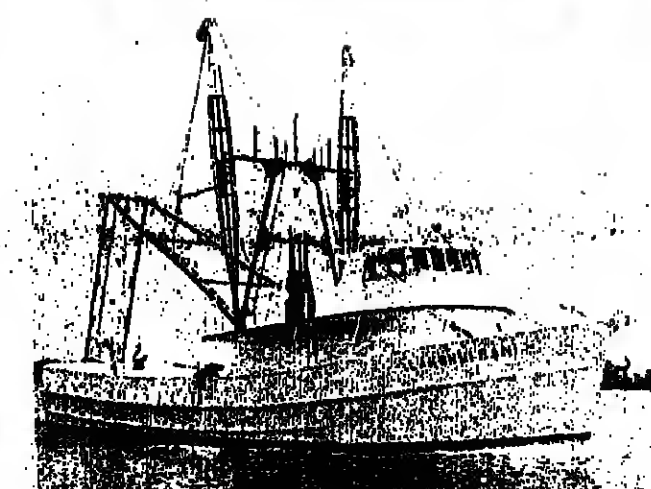
Vast areas in the Bay of Bengal and Arabian Sea rich in fish resources were untapped by Indian fishermen but were being exploited by other nations, he said.

The government was thinking of demarcating zones of exploitation so that trawlers and mechanised traditional boats could be kept out of inshore waters.

Deepsea trawlers owned by the big companies may be forced to work beyond 20 km from the shore and mechanised small boats from eight km out.

Mr. Barnala explained that it was the policy of the Janata government to licence big industrial concerns to enter the fishing industry. Such permission had been granted by the previous Congress government.

INDIA 3

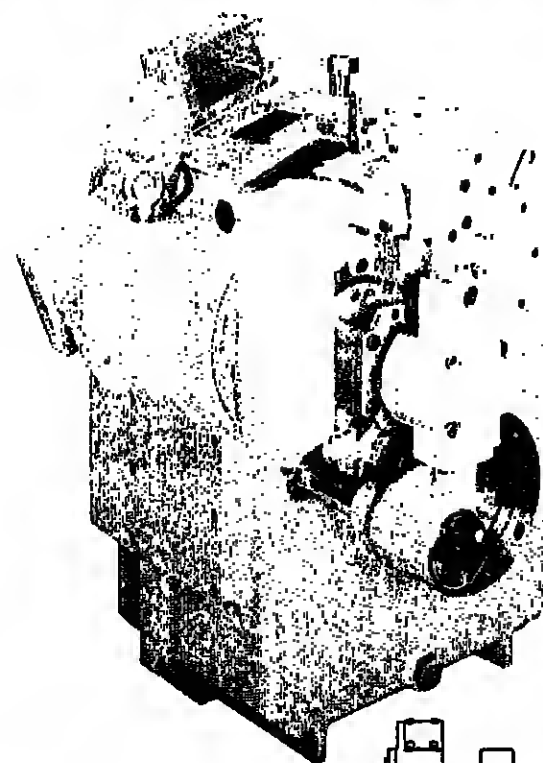


The Indian government's encouragement of deepsea fisheries is opening up a market for modern vessels such as this double rig shrimp trawler built some years ago in the United States.

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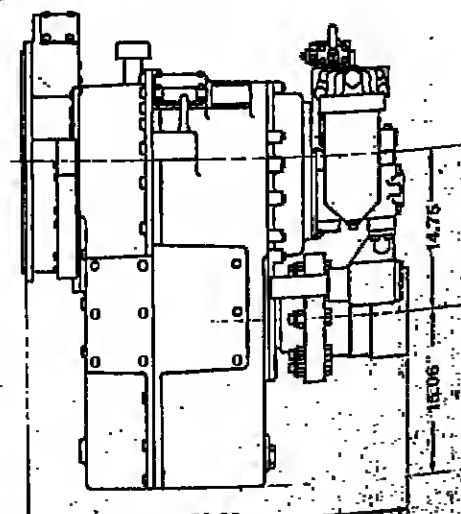


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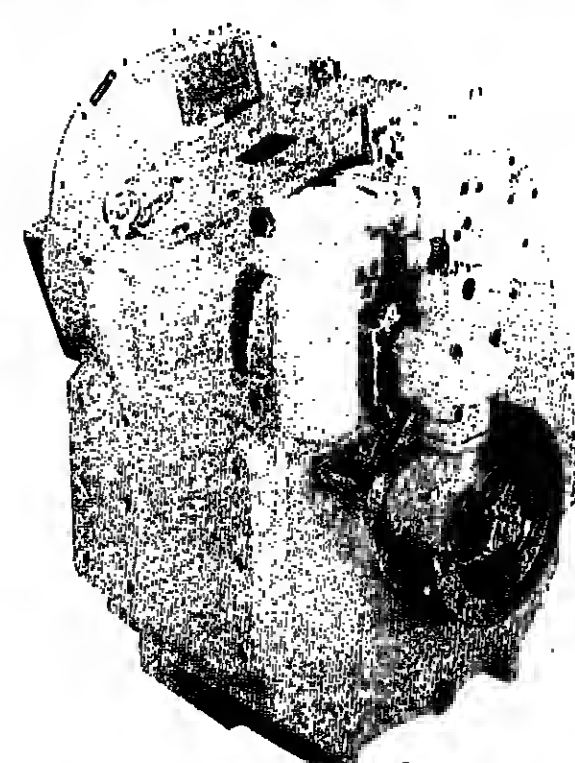
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MG-520

engines.

Model MG-520

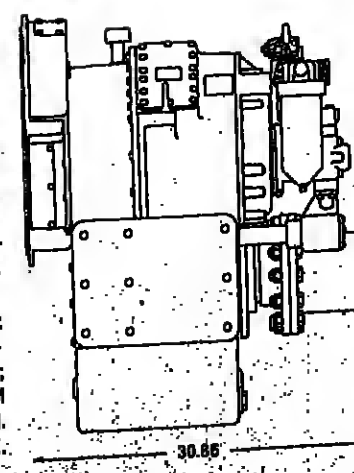


Twin Disc Model MG-520 Marine Transmission. Request Bulletin 319-H-20.

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feature continuous operation in either forward or reverse at full horsepower when installed on standard rotation engines. They utilize Twin Disc's unique Rubber Block Drive that helps cushion transmitted engine torque and compensates for minor misalignment. However, marine transmission manufacturers worldwide strongly recommend that users obtain a torsional analysis from the diesel engine supplier, as torsional compatibility is the ultimate responsibility of the diesel engine manufacturer.

With their deeper ratios and high-speed capabilities, the MG-518 and MG-520 offer users lower cost per horsepower, a balanced design incorporating longevity features, better engine fuel consumption, and significant space advantages since they both are shorter than competitive models in the same horsepower range.

Twin Disc now offers Marine Transmissions in 14 different models with 77 ratios for diesel engines from 100 to 1000 hp continuous duty. For additional information on the new Models MG-518 and MG-520, contact your nearest Twin Disc or marine engine distributor.

Twin Disc, Incorporated
Racine, WI 53403 (414) 634-1981



INDIA 4



WHILE British shipbuilders were visiting India, the British fishing industry was visited by a group of sea product exporters from India. Sponsored by the European Economic Community, the mission represented the fast-growing fish industry. Its members were in Britain, both to investigate markets and to discuss possible joint ventures with UK companies.

They are seen above while visiting the 4.9 million cu. ft. capacity cold store of Frigiscandia in Stratford.

As well as a conducted tour of the Stratford complex, the visitors were given a presentation of the company's current cold storage and freezing technology.

This is one of several visits abroad made by seafood producers in India to study prospects and to learn how they might develop the fish resources off their country.

With the introduction of some 200 trawlers, expected, and the entry of more business houses, India is looking to a big increase in fish production. Much of this will be marketed locally, but there will be spillover of more use for sale outside.

These will be promoted by the companies working in co-operation with the Marine Products Export Development Authority (MPEDA).

INDIA 5

ITALIANS ARE INTERESTED

ITALIAN fishing firms are willing to collaborate with local counterparts in developing deepsea fisheries in the waters round India. Dr. V. Petrone, commercial counsellor of the Italian Embassy in New Delhi, announced recently.

He said Italian firms were prepared for joint ventures on a catch-sharing basis, and would provide trawlers

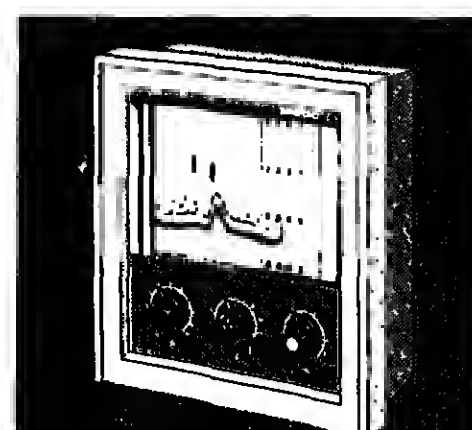
equipment and specialised staff.

They would also help set up facilities for refrigeration and marketing products abroad.

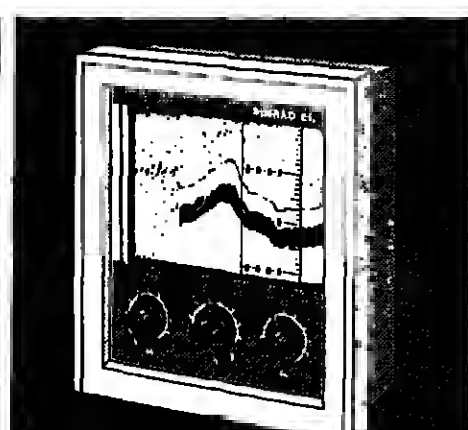
He estimated that 30 million dollars out of Italy's suppliers credits to India still remained unused, and this could be available for buying trawlers and equipment.

Dr. Petrone said Italy offered a good market for Indian shrimp.

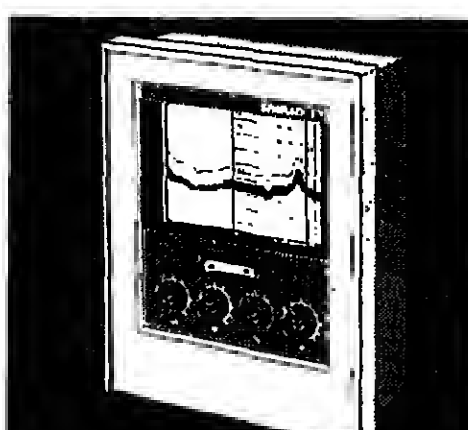
Whatever your fishfinding ambition,
the SIMRAD range has just the fish



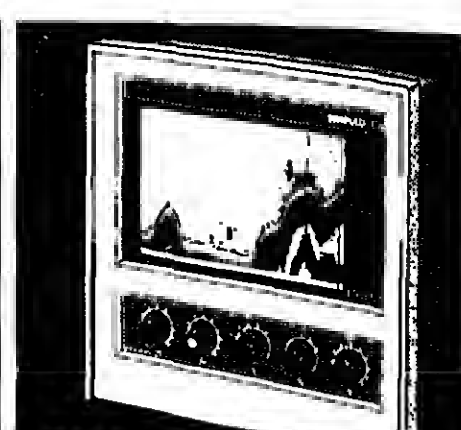
SIMRAD EY
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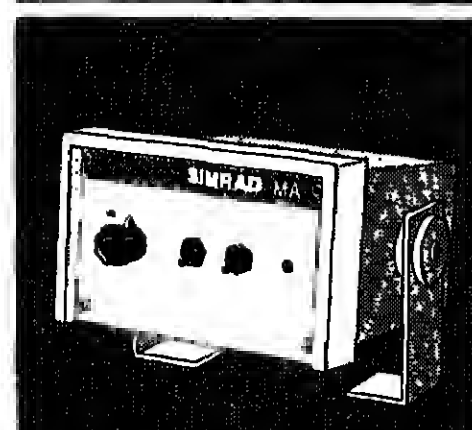
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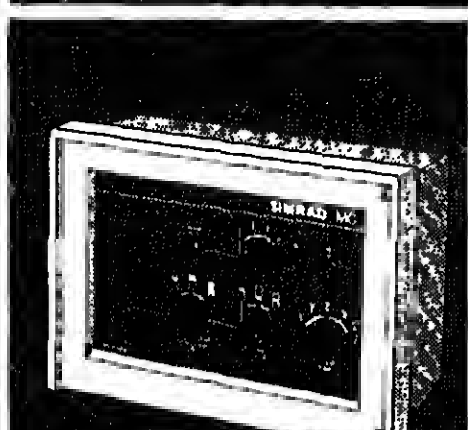
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Echo Sounder



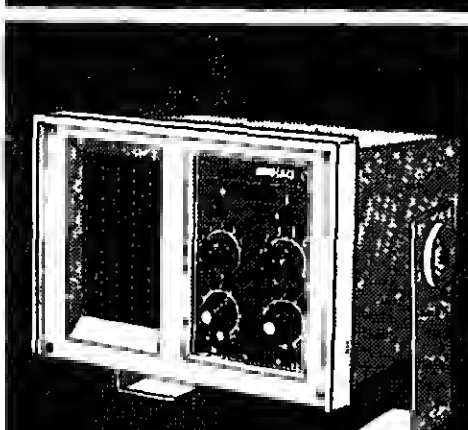
SIMRAD EQ
Echo Sounder



SIMRAD MA
Echo Magnifier



SIMRAD MC
Scale Expander



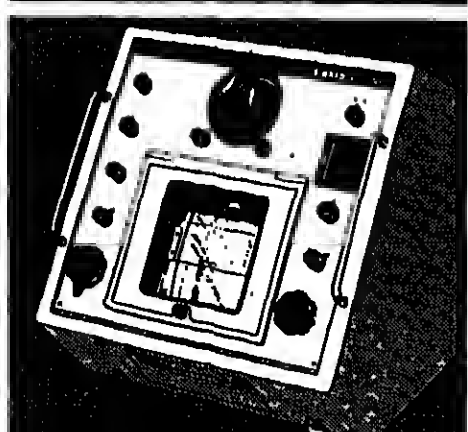
SIMRAD CI
Echo Scope



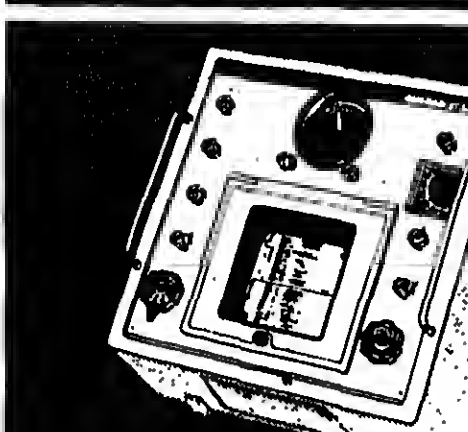
SIMRAD FH
Net Sounder



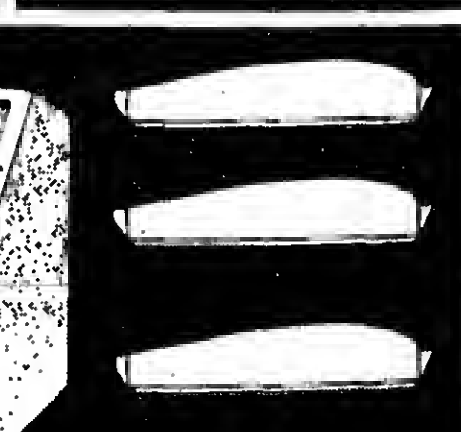
SIMRAD SL
Sonar



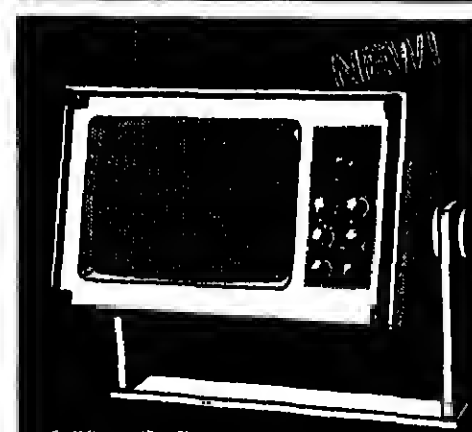
SIMRAD SQ4
Sonar



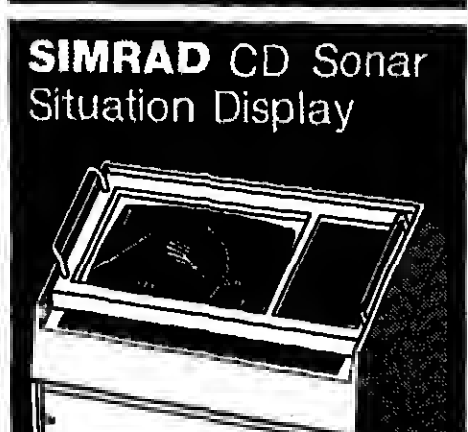
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SIMRAD

Canadians argue over fleet plans

THE CANADIAN federal government has poured cold water on the Maritime provinces' plan to expand the Atlantic coast fishing fleet. But the plan still serves as the basis of exchanges between federal and provincial governments over development of the fishing industry.

The plan was first announced in August 1977 at the Halifax fishing exhibition. But it was only revealed in detail several months later.

By then the federal government, which has the main fisheries jurisdiction, had made it clear that it was not going to spend large sums to expand a fleet that was not making money at its existing size. However, the provincial ministers, Dan Reid of Nova Scotia and Walter Carter of Newfoundland, say that unless the federal government provide tax incentives and the right investment climate, Canada will be unable to harvest the growing fish stocks of the future and foreigners will get more.

In April, Reid told the Nova Scotia legislature that federal projections on stock re-growth appeared to be

conservative and the province's fisheries would not be able to take advantage of the increased stocks without more investment.

Carter has said the provinces will never be satisfied as long as the federal government allows foreign fishing in the 200-mile zone.

The federal fisheries minister, Romeo LeBlanc, says Canadians will have only themselves to blame if the stocks, decimated by decades of heavy fishing, are not allowed to recover.

He said he would like to see the existing fleet converted

and adapted to make the maximum possible use of existing fisheries. His main concern was to make sure the inshore fishermen benefit from the fisheries zone and with them, the communities that dot the eastern coast of Canada.

The two levels of government agree on the need to replace older vessels and to allow some selective expansion of the fleet. But that can be easily done under existing policies, federal officials say. And the industry isn't making requests to Ottawa for financial help for new vessels.

Halibut survey boat charter

THE International Pacific Halibut Commission plans to charter two boats for about 35 days each. The charters will begin on or about August 15, and the vessels will fish with longline gear at predetermined locations.

These charters are intended to obtain data for stock assessment. Catch and effort statistics will be gathered and some halibut will be tagged and released.

Kodiak

Both vessels will probably start fishing at Kodiak in Alaska and then proceed to Hecate Strait to complete the operation. The charters will start and end at Kodiak or Prince Rupert, depending on the operating schedule.

The vessels sought must be fully equipped for setline fishing and have suitable accommodation for two Commission employees and five or six crewmen including the skipper.

Aid for B.C. fish farmers

FISH farmers in British Columbia could now qualify for benefits under the Agricultural Credit Act, including loan guarantees or partial reimbursement of interest on loans from specified lenders.

The country's fish farmers are now defined as involved in the primary production of fish for human consumption, raised under controlled conditions in a fresh water environment.

Oil debris problems

EVIDENCE before a British Parliamentary Committee by the Scottish Fishermen's Federation pinpoints some of the problems facing inshore fishermen as a result of oil activity in the North Sea.

This includes loss of access to fishing grounds, and hazards caused by the masters of supply vessels, who fail to appreciate the limited manoeuvrability of a fishing vessel with her gear out.

Debris

Floating debris causes many accidents, the committee noted in its report. For instance, a piece of rope thrown overboard can foul a propeller, and this in turn can lock and tear an engine from its mountings. Any items of gear liable to come adrift or be jettisoned should be colour-coded or otherwise per-

manently marked so that the company responsible can be identified.

The British government is advised to seek international agreement to enforce such a requirement, possibly through the Oslo Convention for the prevention of marine pollution through dumping items from ships and aircraft. This should be made a condition of the granting of oil exploration and exploitation licences.

It was emphasised in the report that compensation for damage caused by debris should be paid promptly and without quibbling, and that it should be generous rather than the bare minimum required.

So far, pollution has been a less serious problem, but there are fears of an ultimate serious spill for which, again, prompt and generous compensation is indicated.

FISH DEALS SET UP IN SRI LANKA

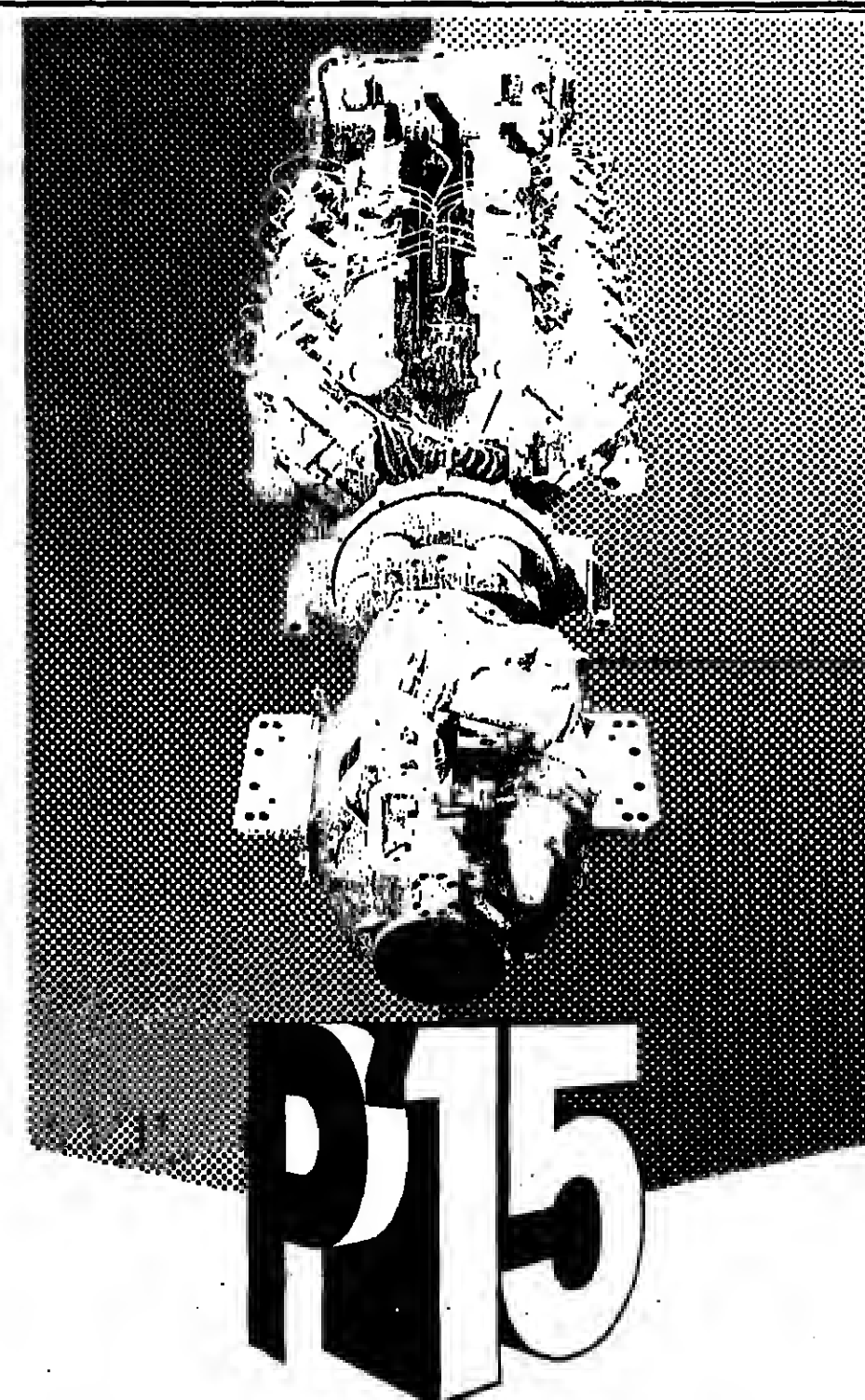
SRI LANKA is to open its waters to foreign fishing fleets in an effort to provide cheaper fish to local consumers. But their ships can only operate in deep sea areas. A coastal limit out to 25 miles is to be reserved for local fishermen.

This move will also help the Galle fisheries harbour which was built at a cost of millions but has been little used since completion.

Already three contracts have been signed with Hong Kong, Singapore and Japan based companies.

In return for fishing in the waters, the companies must sell 40 per cent of their catch to Sri Lanka. Payment will be made in Sri Lanka rupees at pre-agreed prices and Sri Lanka will take only fish popular with the local consumer.

In addition in the 40 per cent, the government will also charge a royalty for the remainder of the vessels' catches. Festus Perera, the Minister of Fisheries, expects a substantial reduction in fish prices locally as a result of this deal with foreign companies.



P15

The P15 is a proven marine engine in the BAUDOUIN range. Like all BAUDOUIN engines, it is supplied as a complete propulsion unit to satisfy your particular requirements.

The P15 is the latest development from BAUDOUIN engineers and results from systematic research and continuous product improvement programmes. The P15 is a dependable marine engine built by BAUDOUIN, the specialist in marine propulsion.

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One of the three British trawlers — the 68.3 metre *Cassio*.

Look into Cat Power

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These compact diesels leave extra space for catches or fuel reserves. They're economical and easy to service, with

adjustment-free fuel systems featuring automatic variable timing to save fuel.

They're simply designed and quality built — with total hardened crankshafts, high strength main bearings and low friction pistons for long life and dependability. Shielded or watercooled turbochargers and exhaust manifolds give cooler engine rooms, greater protection against fire risk.

And they're backed by your Caterpillar dealer. Ask him for the new Cat Marine Service Directory listing engine support services at your ports of call.

Cross-section shows simple design of the compact inline-6 Cat 3406 TA — rated 205 kW at 1800 rev/min.

CATERPILLAR

SWITCH FROM COD TO REDFISH AND MORWONG

THE JOINT deepsea fishing venture between British United Trawlers of the United Kingdom and two Australian companies has just come into full production, reports FNI correspondent Peter Pownall.

Main catching units in this operation are the three BUT freezer stern trawlers *Othello*, *Orsino* and *Cassio*. The *Othello* sailed out to Australia towards the end of 1977 and she has been followed by her two sister ships. They are now supplying a new \$A1.5 million processing plant in Albany, Western Australia.

Sited on a 60,000 square metre waterfront location in Albany, the factory is one of the largest and most modern fish processing plants in Australia.

It covers 2,500 sq. m. and is equipped with two mechanical and one hand filleting lines. With more than 1,000 metric tons of refrigerated storage, it is capable of handling 10,000 tons of fish a year which can be doubled in the future.

Export markets

Fish is processed and packed in the Albany factory which has been built to Australian export standards. Initially, processed fish will be sold in Australia, but ultimately the company — Southern Ocean Fish Processors Pty. Ltd. — hopes to develop export markets.

More than 20 species are caught in the Great Australian Bight by the three stern trawlers that supply Southern Ocean Fish Processors' Albany factory.

The main species are: redfish (*Trachichthodes garrardii*), morwong (*Nemadactylus macropterus*), deep sea flathead (*Neoplatycephalus species*), queen snapper (*Pterygotrigla polyommata*), john dory (*Zoys faher*), king dory (*Cyttoidops maculatus*), hapuka or groper (*Polyprion oxygeneus*), tuskfish (*Dannewigia tucsa*), snook (*Leionura atun*) and squid.

Frozen blocks

Fish are sorted roughly into species aboard the trawlers at sea and are then frozen into 30kg blocks and stored under refrigeration. Frozen blocks are thawed in a Torry A/C defroster, in the Albany factory and the fish then pass through a grading line, a scaler, a chiller and a washer.

Elevators take the fish into the main air-conditioned factory. Product to be processed mechanically goes through a Baader filleter and skinner.

Fish intended for hand filleting (generally larger, higher priced species such as queen snapper) are washed and scaled and elevated to the 12-station line in another part of the factory.

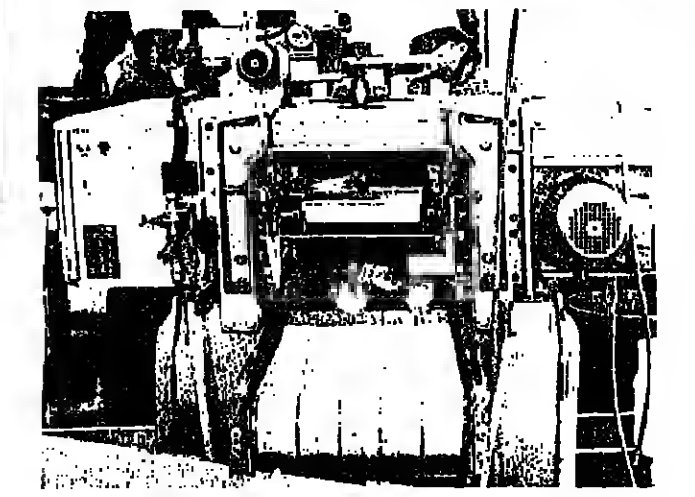
Filletlets are packed according to species and snap frozen in three 11-station ACM6 plate freezers with a capacity to handle 15 tons of fillets in an 11-hour period.



Frozen fish blocks in the company's 1,000-tonne capacity refrigerated store at the Albany processing plant.



Company processing manager Peter Perry inspects defroster Bight red fish.

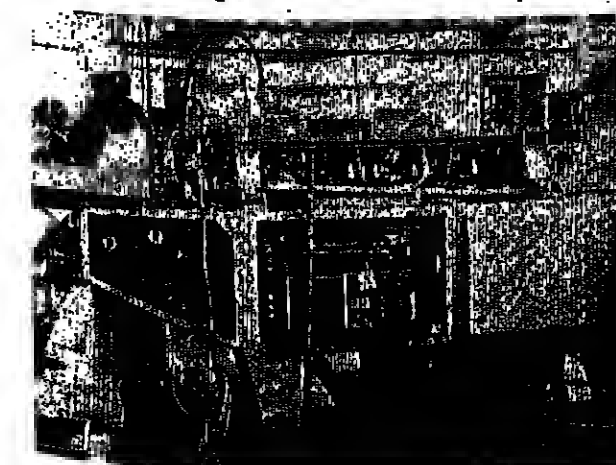


A Baader skinning machine.

An FNI special report

Conveyors transport offal, heads and frames from the processing section to adjoining areas for disposal. Heads are packed for sale as rock lobster bait and frames are processed in a Baader 697 fish recovery unit. There is also provision for freezing and storing species of fish not required for filleting. These are packed for bait and other outlets.

The factory is also geared to



One of the two Baader filleting machines.

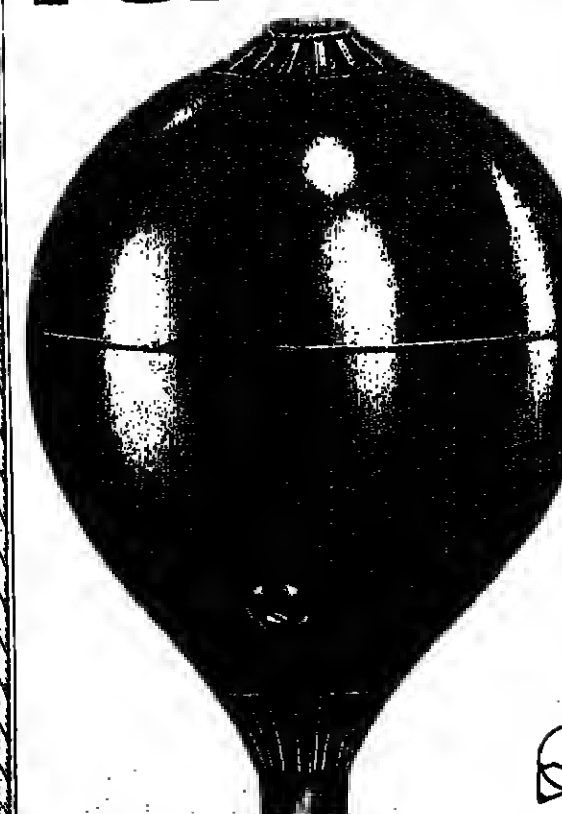
handle fresh fish in a special reception area.

The three 68.3 metre long *Othello* class trawlers fishing in the Great Australian Bight for Southern Ocean Fish Processors were built in the Clyde, Scotland, for British United Trawlers of Hull 1966 and 1967.

Before they came to Australia they fished in the Barents Sea, inside the Arctic Circle, where sea and weather conditions can be some of the worst in the northern hemisphere.

The ships fish the Australian continental shelf between 85 and 110 fathoms using midwater and bottom trawling gear. Up to the end of May two of the trawlers, the *Othello* and *Orsino*, had landed nearly 1,000 tons of fish from three trips.

POLYFORM SERIES CC Multi-purpose buoy



Flexible hose through centre for moorings

SIZE 40" to 30" 25mm to 25mm 25mm to 25mm 25mm to 25mm

CONCRETE 18kg to 20kg 18kg to 20kg 18kg to 20kg 18kg to 20kg

LENGTH 12m to 15m 12m to 15m 12m to 15m 12m to 15m

WIDEST POINT 12m to 15m 12m to 15m 12m to 15m 12m to 15m

HOSE DIA. 25mm to 25mm 25mm to 25mm 25mm to 25mm 25mm to 25mm

STD PACK 18 to 2 18 to 2 18 to 2 18 to 2

CONTENTS NET WEIGHT 18kg to 20kg 18kg to 20kg 18kg to 20kg 18kg to 20kg

NET WEIGHT 18kg to 20kg 18kg to 20kg 18kg to 20kg 18kg to 20kg

VOLUME 18kg to 20kg 18kg to 20kg 18kg to 20kg 18kg to 20kg

PACKS PER PALLET 24 to 12 24 to 12 24 to 12 24 to 12

Fitted with all plastic patent valve for easy inflation and regulation by almost any pump.

Rib reinforcements at hose openings for added strength and flexibility.

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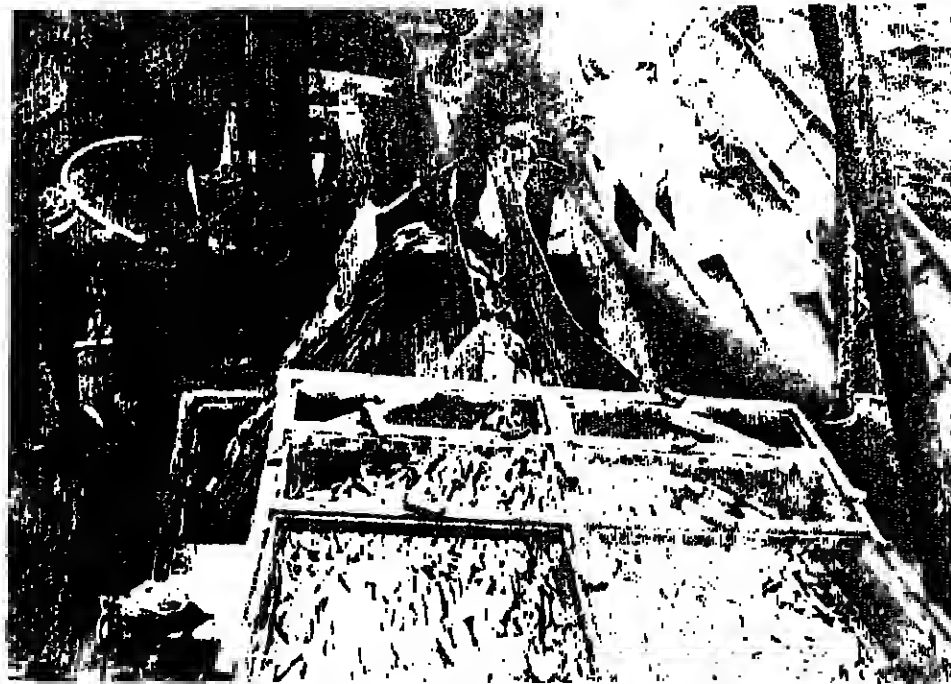
Tuna Longline CC1, CC2, CC3, CC4
Herring Driftnet CC1, CC2, CC4
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CANADA COULD BE TOP EXPORTER



Seen here aboard a Canadian vessel in a test fishing operation... the small capelin is one of the most abundant of the under used species off the Atlantic coast

IF CANADA develops the full potential of her extended fishing zones, the value of her exports of fishery products could rise to \$1,600 million by 1985, from about \$600 million in 1976.

Speaking as a panel member during the Fisheries Council of Canada's 33rd annual meeting in Quebec city last month, R. D. Merner, of the Department of Industry, Trade and Commerce, said that a very significant proportion of the higher Canadian fish output would have to go to areas other than the United States. The US market over the next decade is expected to remain relatively stable.

Rapid changes anticipated in overseas market conditions and in international trade patterns would require considerable additional efforts in gathering information and in market evaluation.

The Department's Fisheries and Fish Products Division, which Mr. Merner heads, is to develop an electronic data processing system to keep the industry informed about foreign markets and competition.

High hopes voiced at 1977 FCC meeting

readily available are herrings, up from 306,000 to 472,000 tons; squid from 11,000 to 100,000 tons; salmon from 59,000 to 95,000 tons, and shrimp from 9,000 to 24,000 tons.

An in-house study of world-wide supply-demand patterns (done in co-operation with the Department of Industry, Trade and Commerce, indicated that total import requirements of all fishery products in major world markets "is likely to be around nine million tons."

"On the basis of current estimates," he continued, "quantities available from Canada, Ireland, Norway and others are not likely to exceed 6.3 million tons, leaving a net deficit of 2.7 million tons."

Cod supplies

Looking at cod supplies, Mr. John said that by 1985 the USA may be wanting 600,000 tons, the EEC 300,000 tons, and Japan, Spain and Portugal 600,000 tons for a total of 1.5 million tons.

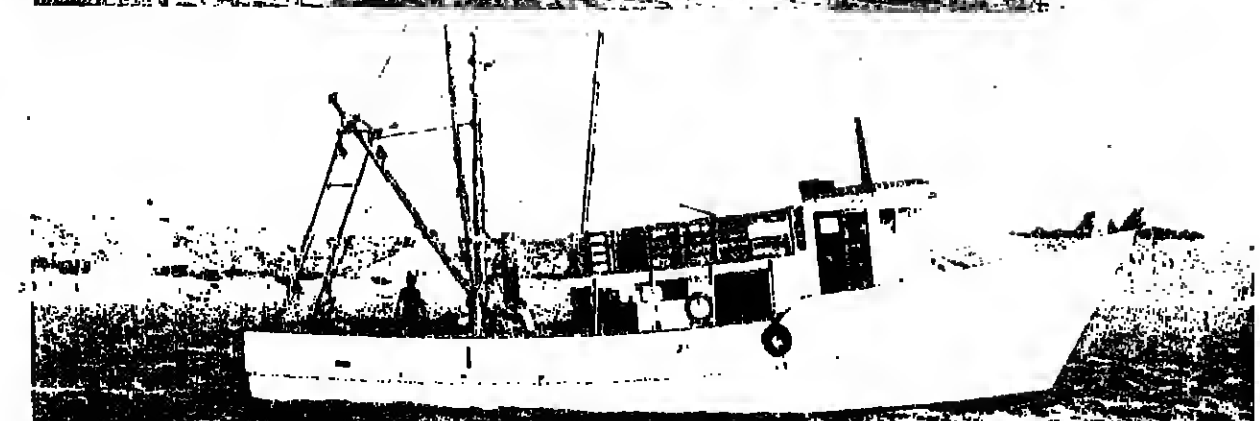
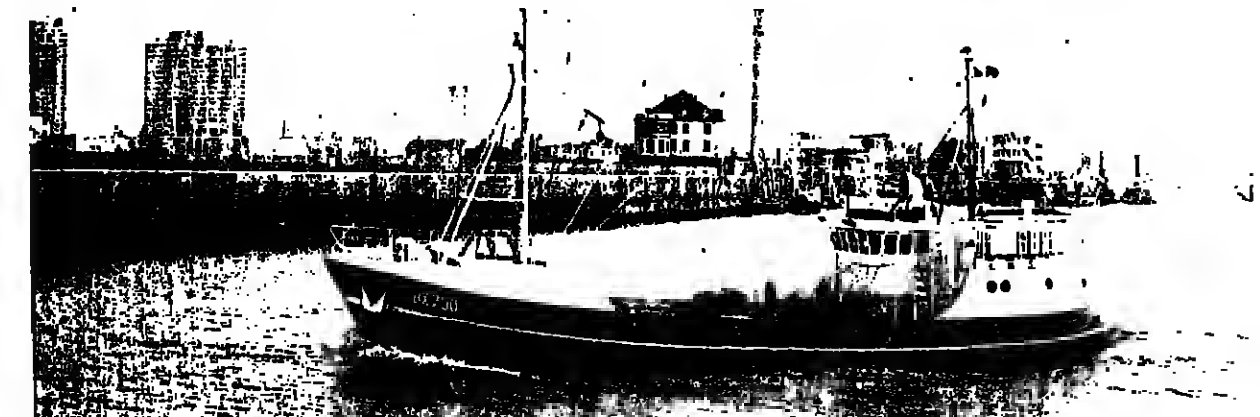
But by 1985 exportable amounts of cod available from Canada (500,000 tons), Iceland (400,000 tons) and Norway (400,000 tons) would be 200,000 tons short of the need.

Summarising net import requirements for all fishery products, he said Japan might want some three million tons, the United States 2.25m tons, the EEC 1.5m tons, Poland 1.65m tons, and other Eastern European countries, including the USSR, two million tons.



Cooking a catch of pink shrimp... up from 9,000 tons to 24,000 tons in 1985

Convincing Deutz Evidence.



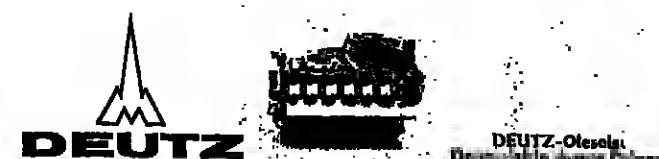
BAM 816, the All-round Power Package.

The compact Deutz engines of the BAM 816 series, characterised by typical Deutz design features, develop their enormous power in a minimum of space.

They are used throughout the world, especially for applications demanding a maximum continuous performance for a minimum outlay.

Mobile or stationary - the Deutz all-round power package is renowned for its reliability.

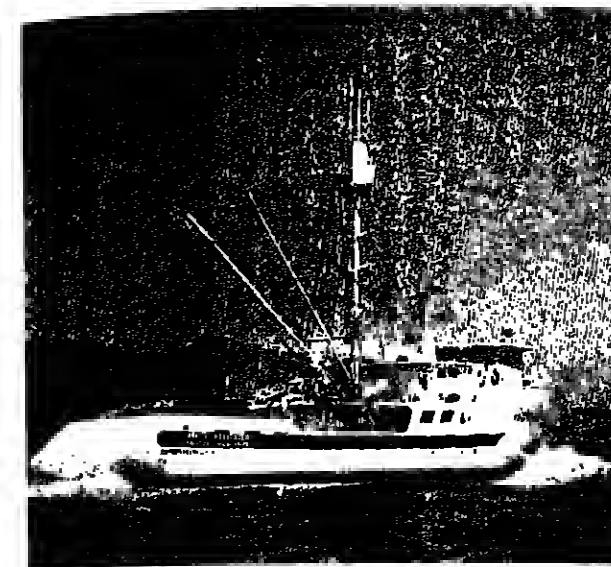
The Deutz BAM 816 range is available as 6- and 8-cylinder in-line engines and 12- and 16-cylinder V-engines.



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A product of the KHD-Group

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Better products and more fish through technology

The Arctic Harvester... adapted to test fish for Dover sole in the waters off British Columbia



Halifax laboratory director, Dr. E. Graham Bligh

DESPITE a period of financial restraint in government and a policy of more research and development being done in the private sector, federal government fisheries laboratories are still carrying out a wide range of projects.

A number of these were outlined by Dr. E. Graham Bligh of the laboratory in Halifax at the Fisheries Council of Canada meeting.

The 200-mile limit, higher costs and resource scarcity were the factors whose "profound impact on Canadian fisheries" created a need for more technology.

They made it necessary to examine non-traditional markets, fishing grounds and species. Canada could also benefit through the application of foreign technology, but this did not come cheap.

Outlining some of the work in research complexes in Vancouver, Winnipeg, Quebec, Halifax and St. John's, Dr. Bligh looked first at the Pacific region where projects included development of an efficient onboard jet fish pump. Designed for herring, this achieved delivery rates of 30 tons an hour.

Also for herring, a stern ramp trawler, the *Caledonian*, had a very successful season catching fond herring.

And she had also done well in tests of Alaska pollock fishing in the Georgia Strait.

In another trawling venture, the *Arctic Harvester* identified commercially exploitable stocks of Dover sole off the west coast of Queen Charlotte Island.

Considerable work is also being done on the processing of herring roe. Dr. Bligh told the meeting that it has been possible to transfer fish from long trips in RSW storage direct to the "popping" line without any brining or freezing.

Cooling

More and more owners are installing air agitation for ice-sea water cooling systems. This was particularly convenient for shrimp and herring.

Inland, in the western region a mobile fish processing plant in two 10 by 52ft. trailers has been successfully demonstrated at three locations. It has its own power plant, cold storage and ice machine.

In the Ontario region, the firm H. H. Milner Ltd. had been working with the federal government and the Ontario Department of Fisheries in a pair seining project. This offers a low-cost

and highly-productive method of fishing from 35ft. boats on Lake Erie.

In the Atlantic region, work has included trials of an automated long lining system in the 95ft. *Clara and Linda*. On her first seven-day trip, the crew of this vessel mechanically baited 82,000 hooks, set and retrieved them, and caught 115,000lb. of fish.

A "rope wing trawl" used successfully in some European countries, notably Poland, was mentioned by Dr. Bligh as another example of imported technology tried out in Canada. This trawl has been successful in the groundfish industry, and has fished mackerel offshore.

A new shrimp sonar has been developed in the Maritimes and is now undergoing tests in preparation for commercial trials.

On a larger scale, the east coast industry has been looking into the possibilities of using large factory trawlers on species in areas too distant for the Canadian-owned wet fish trawlers. In co-operation with a major fishing company, the advantages of such a stern trawler on non-traditional species on the Scotian Shelf, "have been clearly demonstrated."

Work in the important scallop fishery has included sea trials of a reel-type mechanical washer. The trials have

demonstrated its effectiveness in eliminating sand particles from shucked scallop meats.

Energy savings have been made through modification of a conventional salt fish drier using a co-ordinated heat pump system. A prototype drier has been installed at Halifax.

Work on the processing of mackerel has led to an effective and safe method of improving storage life of the fish by skinning before canning or freezing. The method uses sodium hydroxide. It has been developed at the Halifax laboratory, and is now installed in a factory in New Brunswick.

Chartered

In northern shrimp operations, one Canadian trawler was chartered and three other vessels permitted to fish for shrimp off northern Newfoundland and southern Labrador. They used an advanced trawl of Norwegian design and between them they caught about six million lb. of shrimp in five months.

Other Newfoundland projects have included a northern inshore scallop survey, improving the storage life of capelin and a pilot project for the processing and storage of seal meat for human consumption.

THREE TIMES MORE FROM THE PACIFIC

THE fisheries of the Pacific coast of Canada could treble in size over the next ten years if underutilised species were fished. This was forecast during the 33rd annual meeting of the Fisheries Council of Canada in Quebec last month by Dr. Richard Beamish of the Pacific Biological Station in Nanaimo, British Columbia.

"We expect new fisheries for hake, pollock, dogfish, black cod, Dover sole, turbot and half-a-dozen other rockfish species," he said.

Research

He also reviewed major research projects which centre on salmon, discussed anticipated future problems, and then turned to the future of fisheries research.

The aim of the programme for enhancement and development of salmon was to double the current catch of salmonid species over the next 15 years; that is, to return the salmon to historic levels.

Turning to the herring fishery, Dr. Beamish said stocks (they collapsed in 1967 and the fishery was closed) "now appear to have been almost rehabilitated, and the

1978 surplus is calculated to be 130,000 tons."

Dr. Beamish added that "we are successfully predicting where herring will spawn and the approximate size of the spawning stocks, but we now have to determine how the management system that is based on spawning grounds can be interfaced with an offshore fishery that may also be fishing mixed stocks."

The shellfish programme, faced with an explosive increase in the demand for some species, has "simply been unable to meet the information need." Major projects include conducting pink shrimp biomass estimates for the recently developed shrimp fishery off Vancouver Island; spatfall predictions for the oyster industry, and some exploratory work for new stocks of prawns.

Other work

Research is also being conducted on clams, squid, sea urchins, abalone and crabs.

Dr. Beamish said that for the first time "we now find it necessary to conduct stock assessments for all important species and to advise managers on quotas and ways to manage the various fisheries."

FISH EXPORTERS ORGANISE

DELEGATES to the 1977 meeting of the Fisheries Council of Canada were given the details of the formation of a sister organisation - the Canadian Association of Fish Exporters. With its membership drawn primarily from the Atlantic coast area, CAFE is part of the Canadian industry's strategy to penetrate new markets.

Wider limits are expected eventually to give Canada much more fish than the home market can absorb. "It was inevitable that we turn to

new markets," said Berch Lake, a director of CAFE, "and we need a vehicle for this purpose."

Initially, CAFE consists of 57 companies involved in export markets. Its aims are to identify and develop new markets, to promote Canadian products in those markets, to provide in-depth market intelligence and outlook surveys, to establish quality criteria, to provide sales functions and services, and to advise government on fish export policies and progress. CAFE will have its headquarters in Ottawa.

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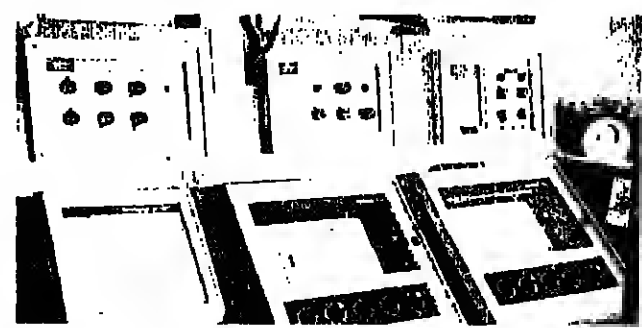
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Electronic array for fish finding in the Teits. Three sonars from three countries — the Wesmar SS220, the Elac Mittel Lodar and the C-Tech Omni-sonar. BELOW: Simrad EQ echo recorders and associated instruments.



FAMILY-OWNED PURSE SEINER

LEADING the way among Scottish fishermen with the introduction of impressive new vessels into the catching fleet is the Tait family of Fraserburgh. As reported briefly in *FN* in May, the family recently took delivery of the 140 ft. (42.7 metre) long *Taits* from the yard of Karmoy mek. Verksted in south-west Norway.

This high-performance combination

purse seiner and trawler is the first of two ships ordered by the Tait family without government assistance from yards in Europe. When both are in service, the total investment in the future of Scottish fishing will amount to about £2.5 million.

The *Taits* is now operating under Skipper Andrew Tait. His brother William is to command the second new ship, which is nearing completion in the Maaskant yard in Holland.

A third Tait brother, Robert, commands the slightly smaller purse seiner *Chris Andra*, which was built by the Karmoy yard in 1975.

The Tait family moved into purse seining only about ten years ago when they took delivery of the 85 ft. long *Conquest*. She was built in Scotland. But the next two vessels — the 86 ft. *Chalkings* and the 89 ft. *Contrade* were built in Norway.

By the early 1970s it had become apparent that these ships in the 80 to 90 ft. range were rather small for full efficiency in purse seining off the British Isles. In 1974, the *Chalkings* was lengthened by 20 ft. and equipped with chilled seawater tanks. This work was done in the Karmoy yard.

Largest

Then came the *Chris Andra*, which cost £800,000 and at the time of her delivery in 1975 was the largest and most sophisticated ship in the British purse seiner fleet. She was also only the second ship to be built by Karmoy and the *Taits* was the third. But the yard could be in for a busy period as world demand grows for this type of compact, well-equipped and versatile ship at the top end of the scale in coastal fisheries.

Speaking to *FN* when his firm took part in an exhibition of ship's gear organised by the Export Council of Norway in London in April, Per D. Holm said the Karmoy works were on an island of the same name about one hour's journey by ship north from Stavanger.

It started about 15 years ago with small fishing winches and submersible fish pumps. The factory now supplies its products world-wide and makes winches up to about 300 tons pull. And it has expanded, first into ship repair and then into building.

Into three

"To handle this development," said Per Holm, "we have divided our group of engineers-constructors into three — one for the winches, one for repair and rebuilding, and one for new building.

"This enables us to offer the complete package consisting of drawings and plans, deck machinery, installation, repair or rebuilding, or delivery of modern fishing ships up to 2,500 tons."

First of two from yards in Europe

The *Taits* is Karmoy's design. On her overall length of 42.7 m. (not 44.5 m. as we reported last month), she has a breadth of 8.6 m. (28.3 ft.) and a moulded depth of 4.25 m. (13.9 ft.). Except for the wheelhouse, all mast, funnel and hatch covers which are of aluminium alloy, the ship is of all-steel construction. She has been built to +1A1 Deep Sea Fishing Classification of Det norske Veritas.

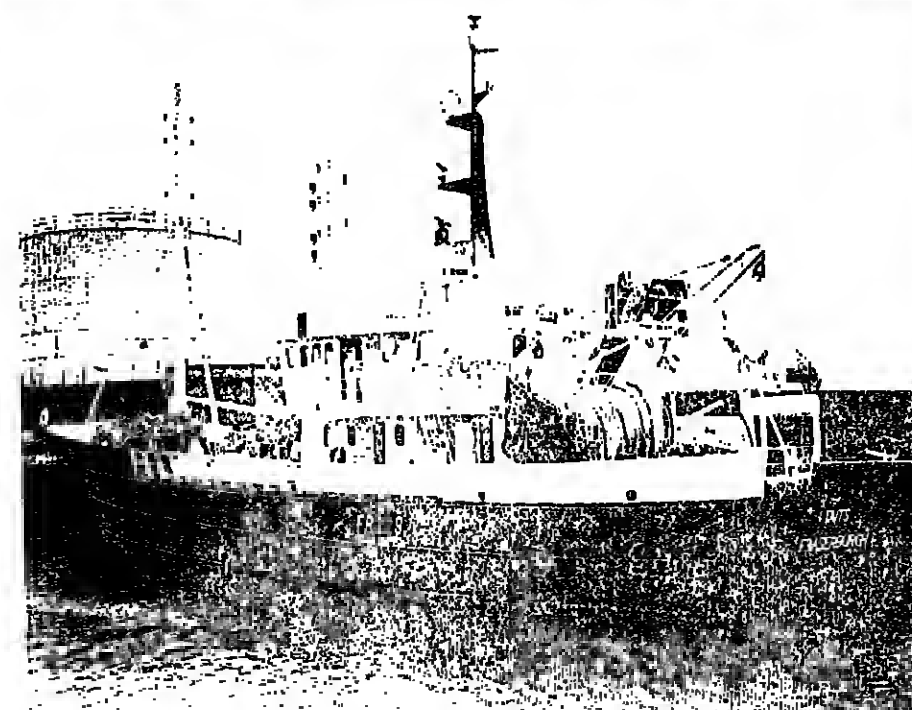
Engines

On sea trials, the *Taits* achieved a speed of 12.7 knots. Her main power comes from a Norwegian Wichmann 4AX diesel developing 1,200 hp at 375 rpm direct driving a Wichmann controllable pitch propeller. Hydraulic pumps for deck machinery and side thrusters are driven by the power take-off shaft at the forward end of the engine through a Karmoy gearbox.

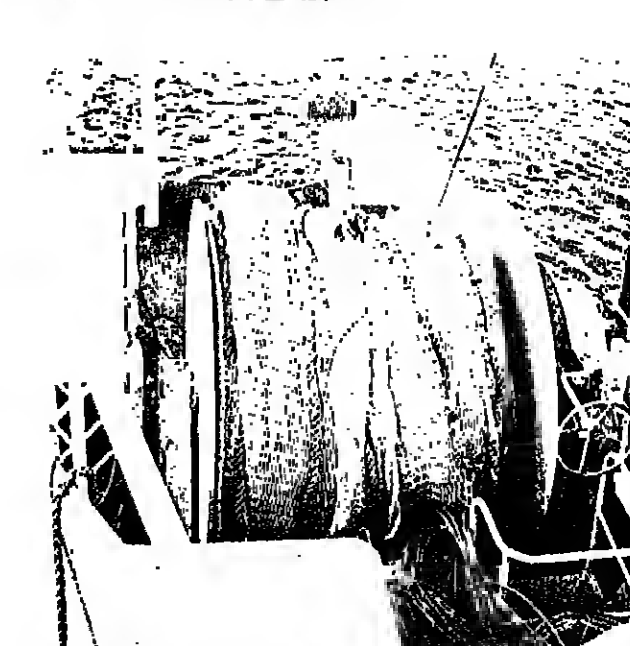
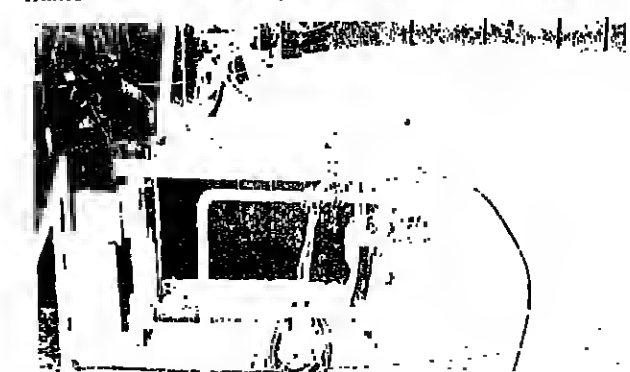
Auxiliary power in the engine room is by two Svaia DS HM01 engines of 200 hp at 1,500 rpm, driving two Newage Stamford 140 kVA alternators. One engine also drives a Vickers auxiliary pump unit for the deck machinery through a Tain Disc clutch.

To assist manoeuvring, the *Taits* is equipped with Brunvoll 200 hp side thrusters.

The *Taits* has six 850 tanks arranged up to 2,500 tons.



The new, Norwegian-built Scottish purse seiner *Teits* — first of two for £2.5 million. The other ship will come from Holland.



Made by Karmoy, the net drum end (above it) the net sounder winch on the port side, aft of the deckhouse.

deck level to give her a carrying capacity of some 470 tons. Their total volume is 480 cu. m. They are served by a Kvaerner Kalde refrigeration system designed to cool 78 tons of seawater from 15 deg. C. down to 0 deg. C. in four hours.

Compressors

Two Hall Thermosank electrically-driven compressors are fitted in the forward end of the main deck and water is circulated through the tanks by Allweiler electric pumps. Water temperature is monitored by Autronic indicators.

Karmoy supplied most of the deck machinery, including purse seine and trawl winch, net sounder winch, anchor windlass, boom swinger and boom lifter, and fish pump. A Trawl gantry spans the quarters and a Karmoy net drum of 25 tons capacity and 8

cu. m. volume is positioned aft of the deckhouse.

A Triplex model 603-360-20 three-harrel net winch is mounted starboard of the deckhouse. This is used in association with two TRH70 transport rollers which direct the net being used into its own bin.

The two bins at the stern emphasise the dual role of this ship. Deck layout and equipment enable her to go to sea equipped with purse seines and mid-water trawls ready to be worked as required. When she began operating, the *Taits* carried Snganet purse seines and Norsenel mid-water trawls for blue whiting. She also had a set of 5 sq. m. semi-pelagic trawl doors.

A ship of this type is, of course, comprehensively fitted out with electronic equipment for fish finding and navigation. This includes no less than three sonar sets from three well-known makers in

three countries — an American Wesmar SS220 scanning sonar, Canadian C-Tech Omni-sonar, and German Elac Mittel Lodar with LAZ 44 scope.

The rest of her fish-finding aids are from Simrad in Norway. They include two EQ echo sounders, CI Echoscope, MC scale expander and storage unit, FI Trawl Watch net opening and depth indicator.

Simrad's FI Trawl Watch functions as a link between the ship's new sounding equipment and one of the EQ sounders. It uses signals from the net transducer and converts them into markings on the echogram — a valuable aid to mid-water trawling.

Net's position

The net is indicated on the echogram as two parallel lines which represent the opening. It is also shown relative to sea surface and sea bottom and to all recorded fish echoes. The equipment therefore gives information about the position of the net in the water and how well it is fishing. It also gives pre-warning of obstacles on the sea bed or of decreasing depth in sufficient time for the trawl to be adjusted.

In the *Taits*, the Trawl Watch is supplemented by another very new aid to fishing. She is the first Scottish vessel to carry the Simrad Catch indicator, which was described in January *FN*. Consisting of sensors fastened to the cod-end, it shows four stages in the filling of the net. It is designed specially for use in fisheries, such as that for blue whiting, where hauls can be so huge and can be taken so quickly that they can burst the net.

Communication

For communication, the *Taits* has Danish Saitor T126 and -R105 SSB radio telephones, and Saitor VHF RT143 and RT144 sets.

Navigational aids include Furuno FRM 64 and FR524 radars, Decca Mk21 receiver, Navigator AP-6 automatic pilot, and J. G. Krohn compass. She has a Hansen helmman's chair, and Noack searchlight.

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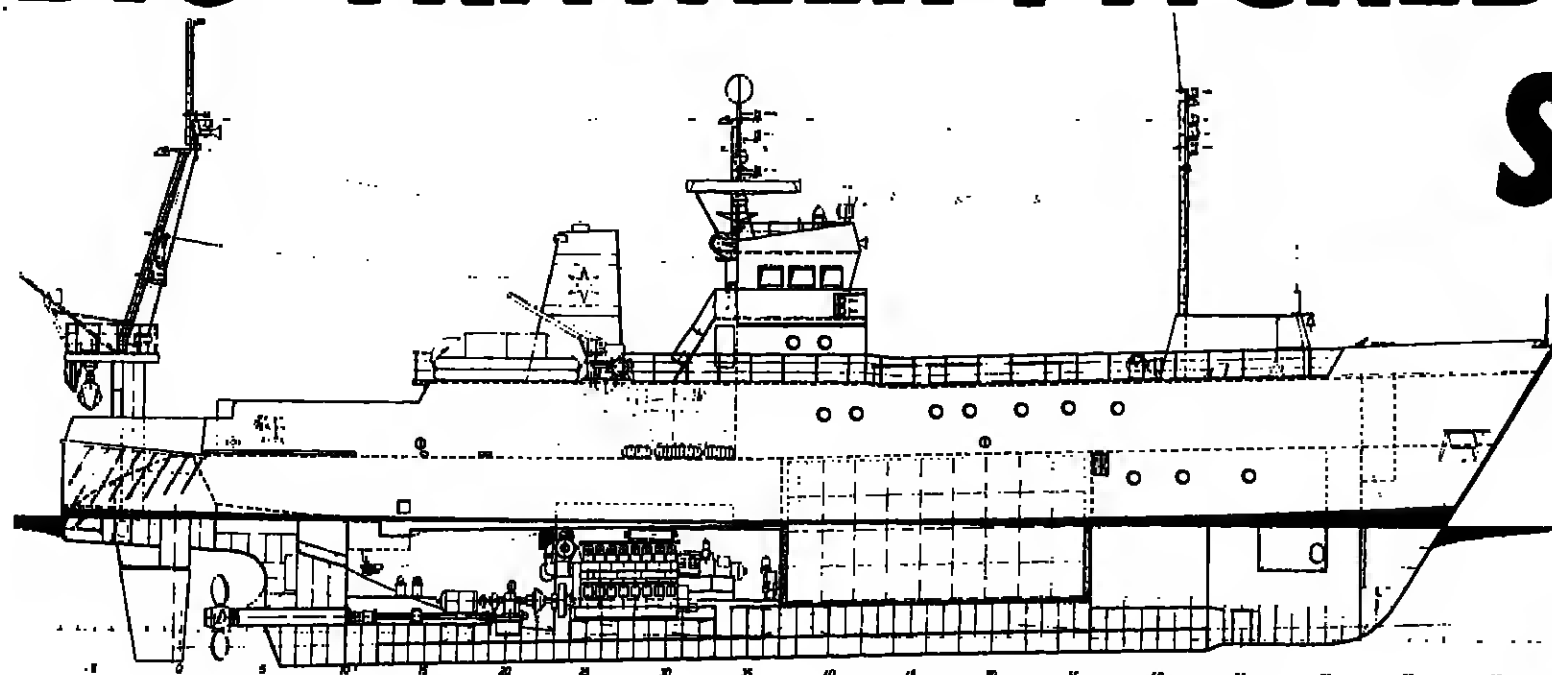


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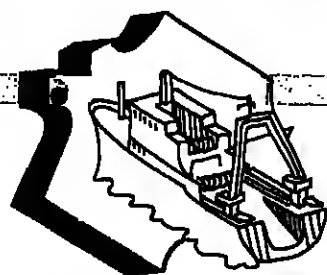
BIG TRAWLER PACKED IN A SMALL HULL



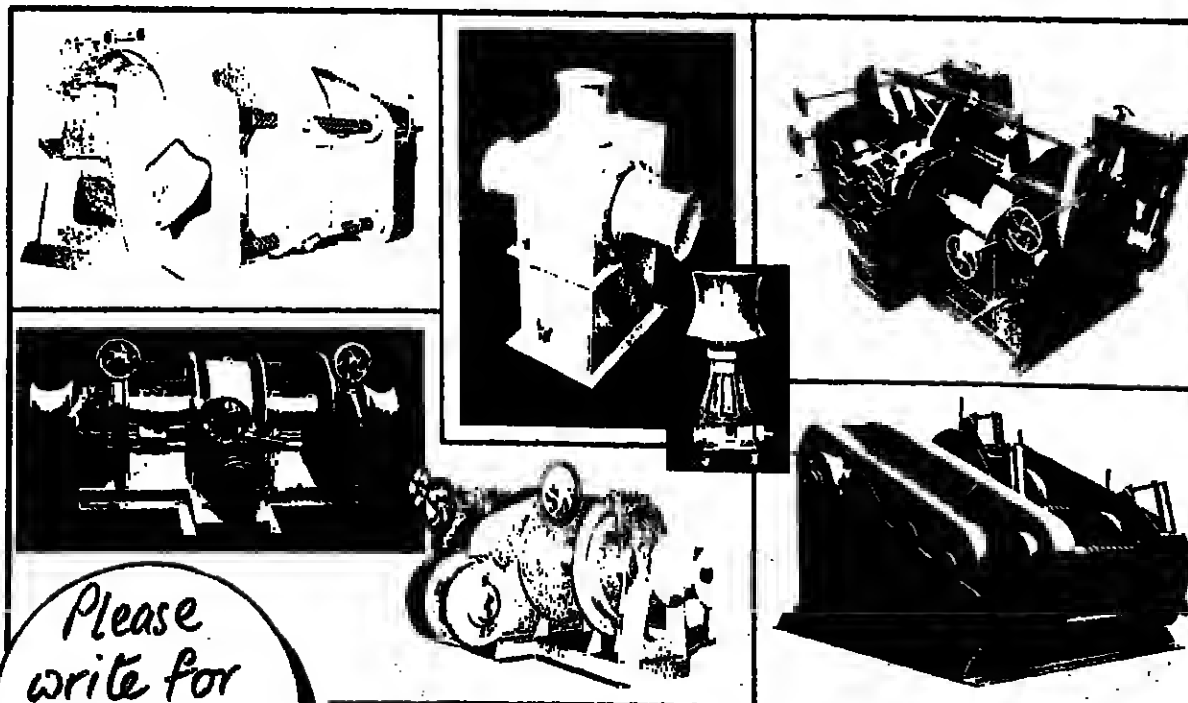
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THE RICKMERS WERFT yard in Bremerhaven has delivered the 950 gross ton wet fish trawler *Sonne* to Hochseefischerei Nordstern AG.

With a length overall of 54.2 metres, the *Sonne* is 46.5 m. long b.p., has a moulded breadth of 11 m. and a depth to shelterdeck of 6.35 m.

Although considerably smaller than the third generation factory trawlers of around 95 metres, built in the early 1970s for West German owners, the *Sonne* matches them as a fish hauler and in gear handling capacity.

In co-operation with Nordstern, for example, the yard has designed a trawl deck with the main winch about amidships, the net drum above and slightly aft, and the auxiliary drums well forward of the wheelhouse.

Explaining this arrangement, Rickmers says that in a ship of this size one of the problems with gear handling is often a relatively short trawl deck. But in the *Sonne*, the deck is 36 metres long which is about the same as that of a 95-metre factory vessel.

Net drum and main and auxiliary trawl winches were supplied by Brussels of Belgium. The main winch is electrically powered by 380 hp motor. Each of the two drums holds 3,000 metres of 28 mm dia. warp and has a pull of 16 tons at a speed of 95 m/min.

Electronic aids

Her fish finding instruments include sonar, an Atlas Fischfinder 781 echo sounder, and an Atlas 781 netsonde. She has two radars, an Atlas 650HS and Atlas 550H.

Fish brought aboard the *Sonne* is first spilt from the cod-end through a hatch lift into bunkers on the processing deck. From there it is taken by Walcker conveyor to one of three Bamber gutting machines — two 159s and a 162.

After gutting, the fish is washed. It may then be held in buffer stage bunkers before stowing or it may go direct into the large 560 cu. metre capacity insulated fish room. This extends up through two decks and is sited forward of the wheelhouse. For discharge of the catch ashore, it is served by three hatches.

The main engine of the *Sonne* is a Mtk 8M 452 AK diesel developing 2,400 hp at 500 rpm. The engine speed is reduced to 200 rpm in a Tacke gearbox driving the Escher Wyss controllable pitch propeller and two 560 kVA alternators. A third 560 kVA alternator is driven by a Daimler diesel engine.

Accommodation of a high standard is provided for a crew of up to 18 in six single and six double berth cabins.

First of new class

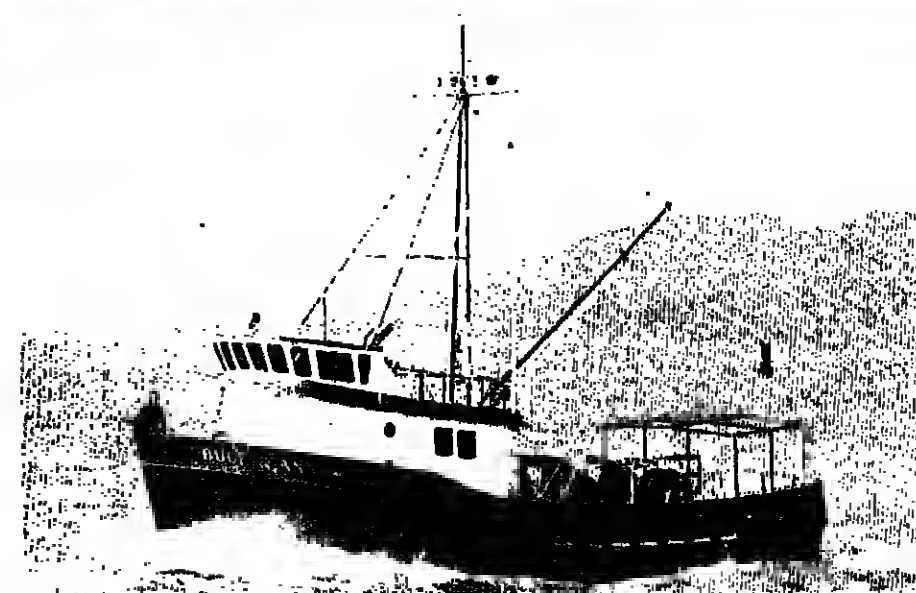


HALMATIC (Scotland) Ltd. has completed the first of its new Skerries 29 class of small GRP hull fishing boats. Named *Ardmore Rose*, the boat has been delivered to John Ridgeway of Ardmore in Scotland.

With an overall length of 29 ft. (8.84 metres), she has a beam of 12 ft. and a draught of

4 ft. She displaces eight tons. The *Ardmore Rose* is powered by a 120 hp HRW4MGR diesel engine developing 59 bhp.

Developed from the original Halmatic 28, the Skerries 29 has several new features. These include: four-inch additional freeboard and extensions of GRP for ancillary components.



Halibut boat built in Astoria

AN 8V-71 Detroit diesel engine powers the new halibut boat *Buck & Ann* built in Astoria, Oregon, USA, at the Larson Boatworks. The 55ft. by 17ft. (16.8 x 5.2 metre) boat was designed by naval architect R. L. Monk of Seattle. She can carry about 35 tons.

Owners, Wayne and Bernice Burkholder will fish the boat mainly in the Kodiak, Alaska, area. A specially-designed halibut line reel is centrally located on the working deck. It was made by Merv Hemmerson of the Pacific Machine Shop.

TWO TUNA SEINERS

THE FRENCH builder Ateliers et Chantiers de la Manche has received orders for two more tuna purse seiners. Its Dieppe yard will build a 69 metre (226.3 ft.) fully refrigerated ship for delivery in March 1980 to the Soc. Industrielle de Pêche et d'Armement (SIPAR).

This brings to four the number of 69-metre tuna ships ordered from ACM. One is building for Abidjan, and two for owners in Cote d'Ivoire and Boulogne.

The second ship is one of the yard's 53-metre long series. It is for delivery in April 1979.

The *Buck & Ann* is also equipped to be versatile in secondary fisheries for salmon and Dungeness crab.

A 4-71 Detroit auxiliary engine drives a Kato 30kW generator which powers two Thermo King blast freezers.

Electronics

The owners' selection of electronics and aids to navigation include Komet/Furuno KRA11b radar, Northern NS71 SSB radio telephone, Wood Freeman 500B autopilot, Komet/Furuno F151C2D echo sounder, and Simrad LC123 Loran C.

Wagner steering from two stations provided control of the gold-trimmed line and white *Buck & Ann* when she was launched into the Columbia River estuary.

Shallow-draft catamaran

THE CARRY-CAT, a twin-hulled workboat well suited to inshore fishing in developing countries, is available from Groves & Cuttridge Yacht Co. Ltd. of Isle of Wight, England.

This 11-metre boat has a large uninterrupted deck area and its free access over bow, stern and sides makes it easy when handling nets and lines. Its twin hulls can be used to stow the catch in insulated containers if required.

The boat has been designed for minimum maintenance using GRP hulls, well protected when landing and berthing, standard easily replaceable plywood or optional aluminium decking and corrosion resistant heavy aluminium channel sections to connect the hulls.

The whole boat can be broken down into component parts of hulls, deck and cross beams, and stowed in a standard 40ft. x 8ft. x 8ft. container for shipment to seaport or inland waterway.

She steers by water jets

Propulsion is by twin diesel engines, driving water jet units, to give good manoeuvrability at all speeds.

The boat has a hauled draft of 2ft. 4in. (0.70m) making it well suited for river use, especially in the dry seasons.

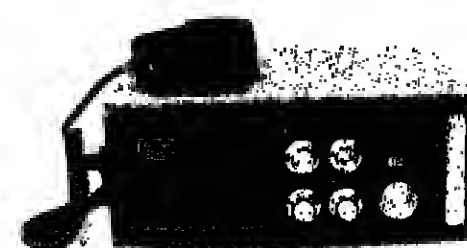
Loading can be from the beach using the hinged low ramp and extensions or direct on to the flat deck from jetties and pontoons.

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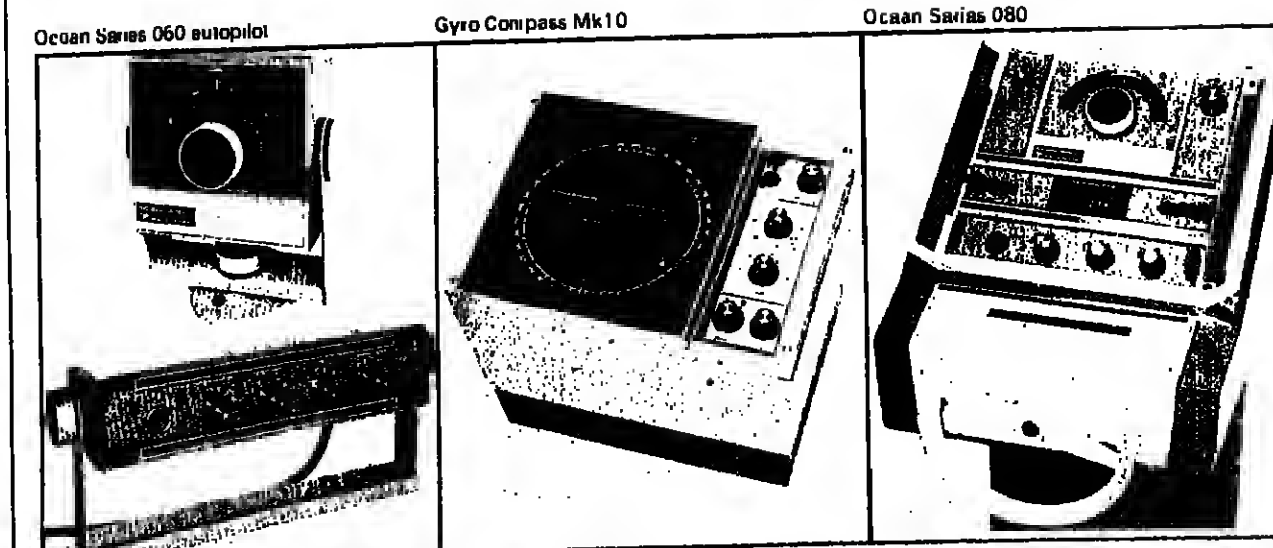


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1 To preserve the good quality of fresh fish, it must be cooled to a temperature below 4° C (41° F) after catching.

This temperature can be obtained with ice or with mechanical refrigeration by air cooling, or by RSW.

If the temperature of the fish is kept slightly below 0° C (32° F), yet avoiding freezing, prolonged storage life and good quality are attained. This temperature can be obtained with RSW.

Because RSW is less laborious and keeps the fish wet and protected in tanks filled with cooled water, this system is widely preferred in purse seiners and even trawlers. The Kvaerner RSW systems have been developed over many years in co-operation with the owners and crews of some of the most efficient fishing vessels in the world.

Above all, the Kvaerner systems are practical, reliable, and require little maintenance. To keep the systems clean and easily cleanable — Kvaerner provides large RSW filters and special shell-end tube coolers.

2 The freezing plates are the key feature of the Kvaerner Horizontal Plate Freezer. Because the plates are 32 mm (1 1/4") thick and made as one-piece solid, rolled plates with drilled passages for the refrigerant, they have sufficient strength and rigidity to secure perfect flatness and close tolerances of the frozen product required for instance for mechanical division of blocks for fish sticks.

The plates will withstand the rough working conditions of the fishing industry and ensure reliable and continuous high output for many years with little maintenance costs.

The plates are fully hygienic and resistant to corrosion because the aluminium is resistant and approved with food.

These advantages make the Kvaerner Horizontal Plate Freezer the ideal choice for the fishing industry.

KVAERNER KULDE

BY THE middle of May some 40 Norwegian trawlers landed a haul of more than 100 tons of blue whiting from ports along the west coast.

As predicted earlier this year, the high performance combination of this fleet have made a difference to the performance on the seasonal concentration of deepwater species.

Blue whiting, it is being most efficiently by large trawling wide-gape mesh improvements in technology strengthened nets and the indicator (see FNI January) reduced the risk of bursting.

Even more important is the ability of the new ships to whiting as it moves north.

Moved early

In the short period of concentration this year, the fleet moved early from west of the Shetlands within the 200-mile limit. There, British trawlers had been caught by the Faroeese government.

But the Norwegians have catches and bringing them home.

In the season in 1977, they took 38,000 tons. This year, by May 12, 70 landings had taken place.

Among the ships bringing several recently described *Melvinn* had 400 tons in *Dalsky*, described briefly by *Liberty* with 1,000 tons. The *Liberty* and the *Senior* had 700 tons.

Also fishing well was the *cutting and processing* *A/S*, she was built by *Verket* of Tjorving for *Nacra* of Leinoy.

The *Poseidon* is 51 metres long, moulded breadth of 12 m, a deck to shelterdeck of 8.05 m, draught of 5.5 m. She is a *Chandlary Division* has shelterdeck with the fore part shelterdeck arranged for processing.

There she has a *Baudouin* machine for herring or mackerel, bone separator, and an *Centrifugal* shipborne fish masher handle 40 tons of raw material.

The *Poseidon* is arranged with bins, each of 65 cu. m. capacity, hydraulic purse seine winches, largest in the range of *Bjorklund* winches.

Trawling role

For her trawling role, she is towing large mid-water nets and trawl winch with each drum 100 metres of wire.

Like the other large ships whiting fishery, the *Poseidon* mid-water trawl by submersible trawl net is led over the Tripex fish is pressed into the cod-end and pump is attached.

If the ship should be used for seining, she has a three-ton crane with topping and slewing winches.

The *Poseidon* has three *Jack* plate freezers and a *Jack* plate freezer. These give her a capacity of about 40 tons of fish.

Below the main deck, the ship has a capacity hold for frozen fish.

GERMINI PAIR TRAWLS FROM COSALT

ADVERTISEMENT SUPPLEMENT

COSALT news

SALES SOAR TO AN ALL-TIME RECORD

INCREASED sales of fishing gear — particularly for inshore boats — have helped boost turnover of the Grimsby-based Cosalt group to an all-time record.

Total pre-tax profits last year reached £1.1 million — almost double the £1.2 million of 1976.

The group's turnover rose from £17.7 million to £23.6 million, and exports were up by more than £1 million.

Cosalt's sales to the fishing industry are developing fast, despite the crippling effects of Britain's distant water fleet.

This is largely the result of a whole new emphasis on supplying the inshore sector — and on rapidly developing exports.

Cosalt has been quick to take advantage of the growing export demand for fishing gear as more and more countries take on 200-mile limits.

The company supplies gear to over 60 countries and, as the export market grows, will be stepping up its participation in most of the major international fishing exhibitions.

Participation in the last United States Fish Expo held in Seattle, in October 1977, has helped to double Cosalt's fishing gear sales to this market in the last 18 months alone.

The company will also be prominent at 'Catch 78' in Aberdeen in June.

During the last 12 to 18 months, Cosalt's Ships Division has purchased the long established Ayrahtre firm of

Focus turns inshore and abroad

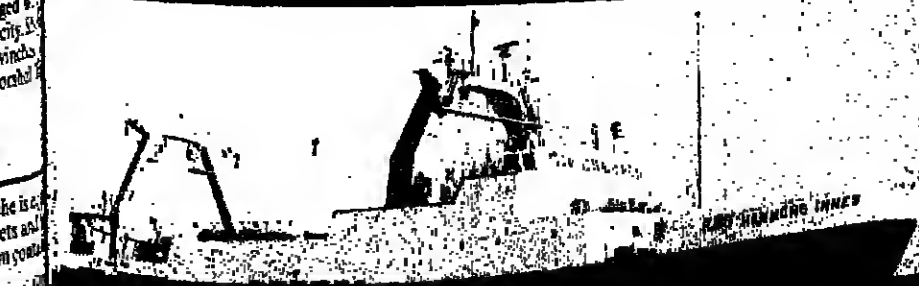
W & J Knox. It has also taken over the twine factory of Belfast Ropework Co., thus giving complete control of the quality of the product from the extrusion stage right through to the finished net.

New Cosalt branches have been opened at Scarborough and Plymouth,

catering specially for the local fishing fleets.

All this adds up to an even better service to fishermen, and reinforces the prediction made in 1973 by Cosalt's John Ross, following his appointment as chairman, that "the future was never better".

Gear for the 'Hammond'



The trawler *Lady Hammond*, formerly the Hull-based *Hammond Lines*, has been sold to Canada for experimental fishing. She left on her delivery trip last week, complete with Cosalt fishing gear.

Her skipper for the voyage is Mr. Max Mac of Nova Scotia who has a mixed Canadian and British crew.

The trawler will carry a pair of high-

opening bottom trawls from Cosalt's Grimsby factory and two Canadian Diamond-9 mid-water nets made up at the company's plant at Fraserburgh.

Throughout her career, the 176ft long wet fisher has been consistently one of Grimsby's highest earping trawlers.

She was built at Beverley in 1972 for Newington Trawlers Ltd.

ocean PROTECTIVE CLOTHING FROM COSALT

Winch put in for a major net repair



W & J KNOX has recently installed a special winch at its Kilbirnie factory to handle a repair on a sprat purse-seine.

The net, worked by *Gallie Rose* (Skipper Wattie Andrews), was purchased three seasons ago. After a lot of heavy use the bunt section wore out and now Knox is replacing it and giving the net a major overhaul.

This is not the first job of its kind handled by Knox, but *Gallie Rose's* large purse seine presented special problems, so the winch had to be installed.

The firm plans to complete the overhaul in eight to ten weeks.



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FNI/285

Grimsby skipper praises 'Gemini'

THE Cosalt "Gemini Mk. II" pair trawl is the most effective net ever used by Grimsby skipper Roger Younger of the Green Valley.

Skipper Younger, who operates through the Denbigh agency of Grimsby, has had a Gemini net since its introduction.

Apart from obtaining additional headline lift, Skipper Younger says that the Mk. II also provides a dredging effect which gives a marked improvement in catches.

New high-lift pair trawl available from Grimsby

Gear expert Clive Radcliffe reports on the latest fishing gear development by Cosalt

IN RECENT years there has been a considerable revival of interest in demersal pair trawling, or seining. The technique, which dates from well into the last century, is expected to have a sound future in the UK with vessels of 200-1500hp, and in the development of artisanal fisheries with boats as low as 10hp.

In net designs used in the UK the first of the more recent pair-trawls was adapted from the Scandinavian Vinge or wing trawls. They are operated with rubber disc footropes interspersed with PVC spherical bobbins along their length. Fine ground rigs may use rubber discs only.

Much in developing this type of trawl has been done by Cosalt.

Initially a 1/10th scale model of the Cosalt Gemini pair-trawl was made by the author and tested in the White Fish Authority's flume tank at Hull.

give the lift and thus allowing the lower wing to stand at a much shallower angle to the sea bed.

Widened

An alternative experiment used a two-seam trawl of equivalent fishing circle to the Panel trawl, but with the additional netting put into the upper and lower sections. The wings were widened and the vee cut back on a side knot, making them much deeper.

These results were also disastrous. The trawl had less headline height than the original and the deeper vee resulted in netting from the lower wing end being slack and trailing on the sea bed.

These trials highlighted the need for new thinking in the development of a high-lift pair trawl, although much had been learned from the research and fishing perfor-

mance of the Gemini which has been improved by the insertion of the side panel.

This led to the design of the Concord being utilised to produce a butterfly type three-bridle trawl having a deep side panel, which retains the maximum depth throughout the wing and finishes in a third vee at the wing end.

The trawl has much wider wings with a range of varying cutting rates in the top wing. This allows a good curve to fit the catenary formed by the headline. The square is marginally deeper than in conventional wing trawls, and the bellies are marginally extended as compared with the original Gemini.

Adjustable

This type of trawl may be adjusted to suit varying fishing conditions.

If the centre bridle tension it will close the panel but allow the top lower wings to open to maximum, and reach the headline height.

If tension is released the main towing struts on the top and lower wings then the net will act like more conventional but-

Promising

The new design has been modelled on behalf of the author, and the results of the early trials are promising, with anticipated headline height of 26.5ft, and similar wing spread as the original Gemini. Up to 250kg of fish may be applied, and still appears to grip the sea bed, whereas a high lift trawl designed to skim the sea bed will not.

These trials are in production and are being used for vessels with a licence from Cosalt's Inshore Department at Grimsby.

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Secretary:
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Registered Office:
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SOUTH HUMBERSIDE DN31 3NW
Telephone: Grimsby 58881 STD 0472
Telex: 52388 G Telex: Cosalt, Grimsby
Registered in London No. 19628

COMMENT

THE STRENGTH of its overseas markets (exports up 64 per cent to £3,200,000), an expanding demand from the off-shore oil industry (sales up over 33 per cent to £2,000,000) and the decision to extend our production and sales facilities to cater for home-water fishing and general chandlery have enabled the Ship Chandlery Division to return record sales (up 40 per cent to £12,455,000) and record pre-interest profits (up 70 per cent to £1,634,000).

Both the assets and the management of W. & J. Knox, acquired in March 1977, made a valuable contribution during the year, the experience and availability of the latter playing a decisive part in the decision to buy in September the net and twine activities of Belfast Ropeworks. The purchase of these two former competitors has enormously strengthened Cosalt's position as the leading UK supplier to the fishing industry.

After the decision to open a branch in Plymouth in April last year, the opportunity arose to acquire the well-established business of Plymouth Ropes in August.

A similar pattern ensued more recently with the opening of a branch in Felixstowe early this year followed by the purchase last month of P. D. MacIntyre (Felixstowe) Ltd, which operates as ships chandlers and bonded warehousemen in that port.

It should not be thought that the improved results are attributed solely to new acquisitions. Each of the branches enjoyed a high level of demand, proving themselves once again highly adaptable, each in the light of changing circumstances in their own port.

Cosalt has a unique branch structure, which is standing it in good stead during what might otherwise have been a very difficult if not impossible time for a more centralised company.

Cosalt has always enjoyed a good demand from its overseas customers, but never have they been more important. The enforced decline in the British distant water fishing industry, now, alas, almost sunk without trace by successive cod wars and political neglect, has been to some extent matched by a corresponding increase in fishing effort by other nations.

Cosalt has been able to meet the demand from these expanding markets as witnessed by its increased exports.

Against a background of general depression in the fishing industry, this Division had to work very hard for its success in 1977. The target for 1978 is to repeat that achievement.

We believe that we have the organisation and the management to achieve that target, in what we expect to be a more difficult year.

The above is reprinted from the Chairman's statement in the Cosalt Annual Report

Excellent results from all divisions

PRELIMINARY STATEMENT FOR 1977

DIVIDING AND SHIP ISSUE: Medium allowable dividend, 4.5 times covered. One-for-two issue proposed, present intention to maintain dividend on new capital if legislation permits.

Ships Chandlery: Strength of overseas markets and expanding demand from offshore oil industry contributed to a record year.

Corenets: Market share and profits improved in difficult trading conditions. Refrigeration and Air Conditioning: Another successful year.

PROSPECTS: Another good year expected, with added capacity in ships chandlery and corenets divisions coming on stream.

Turnover up 28% £23,600,000

Exports up 33% £3,200,000

Pre-tax profits up 87% £2,100,000

Earnings per share up 55% 17.87p

Assets per share up 33% 74.5p

Copies of the Report and Accounts may be obtained after 1 June from the Secretary, Cosalt Limited, Fish Dock Road, Grimsby, South Humberside, DN31 3NW. The Annual General Meeting will be held in Grimsby on 18 June 1978.

COSALT

WFA's flume tank - a dream come true



A demersal trawl under test at the White Fish Authority's flume tank in Hull.

TO THE GEAR manufacturer, the White Fish Authority's flume tank in Hull is like a dream come true. It adds a whole new dimension to gear development and provides a powerful new tool to the gear technologist.

The tank itself is the largest of its kind in the world. Larger than normal scale models can be tested to determine warp loads, effects of towing speed, headline height, wing spread, door spread, door performance, plus areas of slack and strain in various parts of the net.

In the early days, attention was focused on testing existing trawls. Several well-proven nets were modelled and examined in detail.

In one particular case, the tank revealed large areas of slack and baggy netting in a very popular and well-fished

trawl. Various modifications were carried out and a new model made to the revised specification.

So much can be achieved once a trawl has been modelled, simply by experimenting with different modifications.

Profound
The number of floats can have a profound effect on lift; kites can, in some circumstances, be used to good effect; different types of doors can effect spread; varying bridle rigs, towing speeds — the combinations are numberless and intriguing.

Many questions can be posed and answered in a short time by simple modifications. The effects of faulty rigging, bad net fixing or incorrect wire lengths are easily highlighted.

The new Jumbo range of high-lift trawls was developed entirely in the flume tank by Cosalt.

Points which had to be considered at the design stage were good net tailoring with evenly spread netting throughout the trawl and regular taper rates, avoiding areas of strain such as wing quarters and selvages.

The design had to be

Kilbirnie to sell complete purse nets

W & J KNOX will be selling fully-rigged purse seines by 1978.

The company is already a major supplier of purse seine repair panels. And many of its staff who will be working on the purse nets are experienced in making ring nets — until recently an important industry at Kilbirnie.

Knox is also stepping up production of its netting for purse seine repair panels. This decision, made a year ago, has been reinforced by a bulk order for panels from a leading Norwegian manufacturer.

An in-depth survey of the purse seine fleet in Britain has established a requirement for a UK-based net repair depot. Knox is, therefore, modifying its premises and installing equipment for the handling of these nets.

The picture shows Knox staff preparing purse seine panels for shipment to Norway.

Keeping Gourock catching

W. & J. KNOX's involvement in trawl manufacture really got moving in 1975 when the company took over production of Gourock Ropeworks' trawls.

For several years Gourock had not produced its own netting but purchased by the bale from other manufacturers, including Knox. It did have vast expertise in trawl and seine design and construction, going back to the early days when it was the first British manufacturer of the original wing trawls.

Two things were apparent: one, that there was still a demand for Gourock trawls; two, that Knox was going to lose a customer.

David McGeorge, manager of the net loft with 25 years' experience with Gourock, joined Knox and kept the Gourock name alive.

Since coming to Kilbirnie, Mr. McGeorge has worked alongside two highly experienced former skippers — Andy McCrindle and David Forsyth.

These three men formed the initial spearhead of what has grown into a successful department.

Yarns and twines from Annahilt



LAST September W. & J. Knox acquired the Belfast Ropes Group at Annahilt (pictured above). The plant makes a wide range of braided and twisted polyethylene monofilament yarns and twines.

The company is now up-dating the extrusion section and major replacement parts are being fitted. These in-

Revived interest in an old technique

IF THERE is a fishing growing market for these same nets in Britain. Specially designed end hung for fishing above and around wrecks, they are proving most successful in the North Sea with its smaller shellfish bottom and abundant wrecks.

When synthetic fibres revolutionised the industry, Knox installed modern looms designed specially for weaving nylon monofilament.

For many years the vast Canadian cod and Norwegian salmon fisheries were supplied by Kilbirnie, the only UK monofilament net manufacturer in the market.

Today, gill nets are still supplied to the limited number of licensed salmon fishermen in the north-east of England. The adaptation of the trawling grounds and the escalation of fuel costs have led to a re-awakened interest in gill nets.

Knox — a major supplier of polypropylene cod nets to Denmark for the Baltic fishery — now

has a healthy and rapidly growing market for these same nets in Britain. Specially designed end hung for fishing above and around wrecks, they are proving most successful in the North Sea with its smaller shellfish bottom and abundant wrecks.

Tremmle nets are also much on the increase and

Walkway cages for the fish farmer

TO KEEP up to date with the rapidly expanding fish farm industry, W & J Knox is able to produce cage nets to customer specification and a finished cage with floatation collars and walkways.

These cages can be used in both salt and fresh water. If required, they are supplied complete with overhead predator security nets. All

Knox is now finding a demand up the east coast as far north as Aberdeenshire. In recent years the requirement has been almost exclusively from England, with the emphasis on the south-coast.

The very large Irish salmon fishery is an important market. There is a preference for the "single throw" or "black spun" type of nylon net in the south, but the heavier conventional twisted nylon net is still liked in Danegil and the north.

forms of dip end drag nets are available. Knox not only offers conventional knotted nylon netting, but knitted knotless netting to cut down scaling and eye damage. These come in a wide range for all fish sizes.

At present all Knox cage netting is treated with bituminous preservative. It is hoped to modify the plant shortly to provide anti-foulant treatment also.

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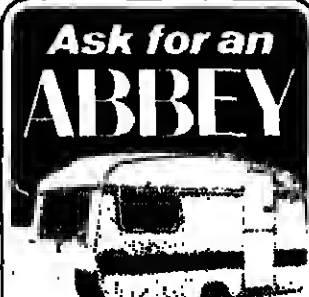
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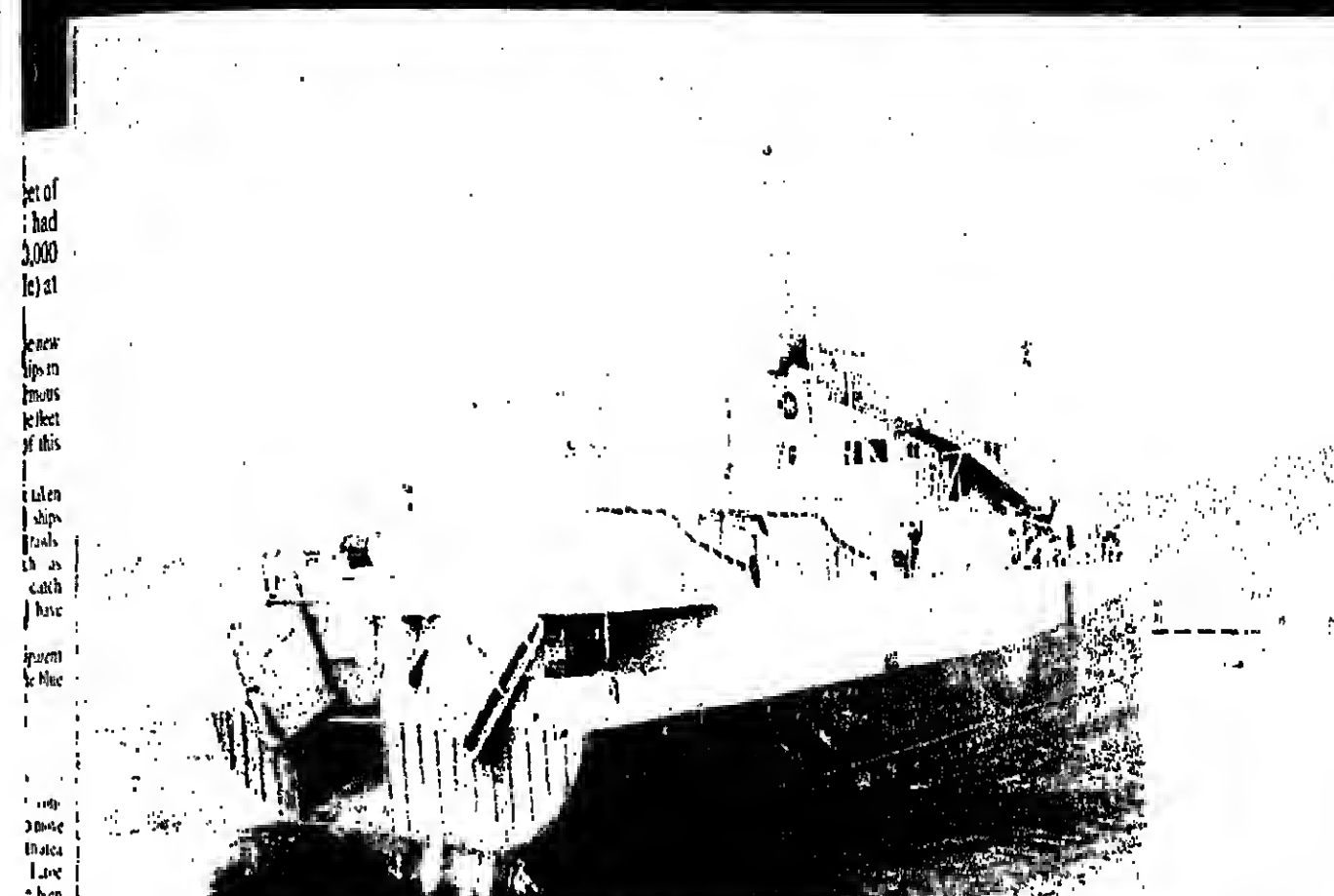
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ORDS GO!



From capelin to blue whiting... and back to capelin. The catcher and processing ship *Poseidon*

tanks of 270 cu.m. and 600 cu.m. for fish meal. The RSW tanks can also be used for storing frozen cargo.

The main engine is a Wellmann 9AN G diesel developing 2,700 hp at 415 rpm and turning a J. W. Berg controllable pitch propeller. Three 480 hp Detroit diesels drive three 375 kVA generators.

To improve manoeuvrability the *Poseidon* has Ulstein 90TV 400 hp bow and stern thrusters. The bow thruster is direct driven by a GM-type 12V-71 diesel engine, and the stern thruster is hydraulically driven from the ship's power plant.

The ship has accommodation for a total of 37 crew in air-conditioned cabins — six of them double and the rest single berth.

According to Oddbjorn Farstad and Svein Hillesoy of Skipskonsulent, the agent in the design of the *Poseidon* is on versatility. She can be used for capelin, herring and mackerel as well as her short role each year as a blue whiting catcher. She is also well-suited for less fishing projects where catching capacity needs to be linked with some processing capability.

The *Poseidon* came into service at the

beginning of 1978 and was involved almost immediately in the northern capelin fishery.

"She worked in the Burren Sea from January up to mid-April," Farstad told FNI. "The weather there was very difficult and the low temperatures affected almost all systems in the ships."

One of the main problems was in the de-watering machine for the capelin. After being pumped from the net, the small fish are pumped up to this machine. But there fish and water froze and many ships had to wait for higher temperatures.

Frozen solid

Another problem came when the purse seine net was hauled through the net winch. As it came out of the water, it froze. Then, even if a powerful winch succeeded in moving it, the net would freeze again before reaching the hull. And then it would freeze in the bin on solid block of water and webbing.

The newer and larger ships such as the *Poseidon* suffered the least from this extreme weather. Their higher freeboard protected them to some extent from icing.

Their higher powered winches were able to move nets faster and so leave them a shorter time exposed to the freezing air.

Overall, said Farstad, the ship performed well as a catcher and a processor. "We feel

that this is a combination that will prove to be right."

With the end of the spring blue whiting fishery, the *Poseidon* is now off to Newfoundland. There she will fish for capelin, producing frozen blocks for food use.

Oddbjorn Farstad and his colleagues in Skipskonsulent have meanwhile come up with a new design for a smaller combination ship. This vessel is 110ft. (33.5 metres) long with a deadweight capacity of 350 tons.

In one version, it can operate, like the *Poseidon*, as a trawler and purse seiner. In a second version, it can also work as a long liner using the automatic system.

Ingenious ramp

Probably the most ingenious of several interesting features of this vessel is a hinged stern ramp. When lowered, this forms a normal shipway for stern trawling, when raised it shuts off the open stern and creates a spacious net bin for purse seining.

The whole working area of the ship is arranged to make the maximum use of the space available in a relatively small hull. There is a trawl arena slightly offset to starboard and carried forward past the wheelhouse and up to the hydraulic split winches right forward.

Farstad expects this design to have varied fishing applications in many parts of the world. It is the type of compact, multi-purpose ship more and more in demand in fisheries working coastal waters reaching out to 200 miles.

Significantly perhaps, the first orders have come from a developing country. Four of the ships are to be built in the Philippines.

TWO JOIN FLEET

ANOTHER new ship for capelin and blue whiting fishing from Smedvik yard is the 52-metre long *Nordsjabas*. She was completed in April and her carrying capacity includes 470 tons in RSW tanks cooled by a Kvaerner system.

For trawling, she is equipped with Hydraulic Brattvaag winches incorporating the Synchro 1010 control system. For

handling her purse seine net, she has a Triplex net winch.

The main engine is a MaK diesel developing 2,400 hp.

From Ulstein Hattlo A/S has come the 52 metre long *Ny-Dolsøy*. This is another combination purse seiner trawler, whose carrying capacity includes 470 tons in RSW tanks.

As in the *Nordsjabas* and many other ships of this type, the cooling system is by Kvaerner.

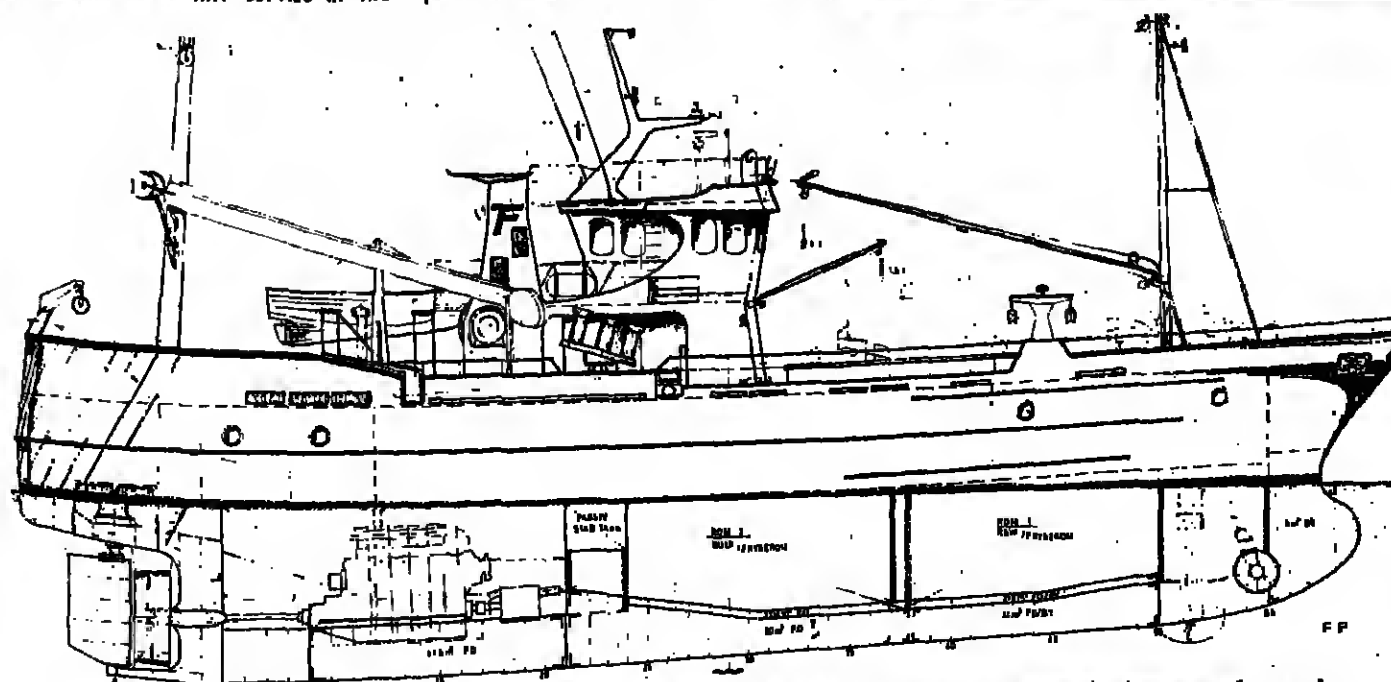
The *Ny-Dolsøy* is powered by a Nohab main engine developing 2,400 hp.

She also has Hydraulic Brattvaag split winches with Synchro 1010 control.

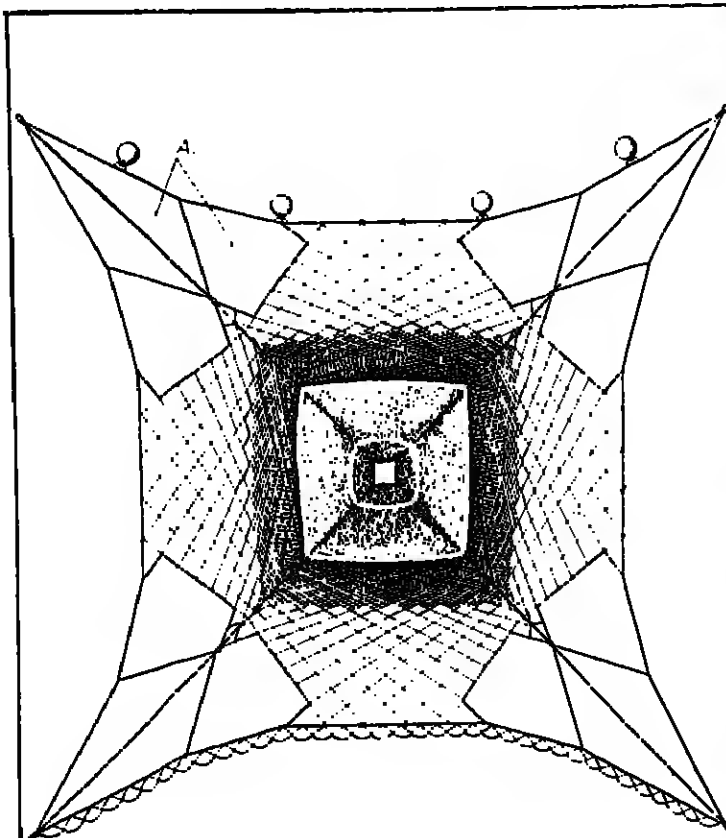
Ships of this type appear to be evolving into more or less standard arrangements of equipment and layout.

Both of these new vessels have superstructure aft and wide and long working deck forward. One new prominent feature is the long-boom hydraulic crane. In the *Nordsjabas*, this is a Hydralift from Nor-Marine. In the *Ny-Dolsøy*, it is a Hlab from Hlab Foco.

Each ship has accommodation for a crew of 14.



Profile drawing of the new Skipskonsulent combination ship arranged as a purse seiner and trawler



Trawl seen from the front.



DANTRAWL are now producing a new type of floating trawl which is revolutionary in its concept.

All the wing meshes have been replaced by longitudinal lines, as illustrated in the drawing. This has been made possible by a new method of calculation which results in the perfect distribution of the load at all points of the trawl.

This method of construction greatly reduces the water resistance and allows the trawl to be towed much faster, or a much larger net to be used with a given amount of power. The trawl is strong, stable and energy-saving, and catches have been in the region of 25% to 70% better than the conventional style of mid-water trawl for herring, sprat, mackerel, sand lance, and pilchard. This net can also be used as a single boat floating trawl.

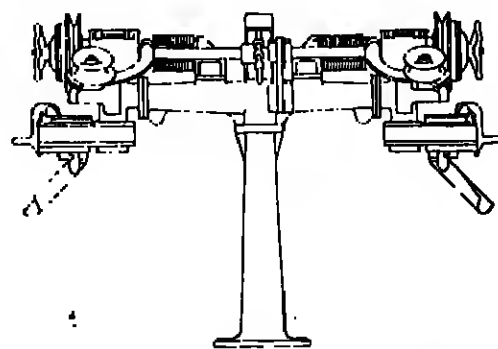
DANTRAWL have been leaders in the development of mid-water trawls in Denmark and this new design is a further step in their traditional business.

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Scotland's biggest show



FROM June 14 to June 18, the Queen's Links site in Aberdeen will be the venue of the biggest fisheries exhibition ever held in Scotland. It will also, say the organisers, Eagle Exhibition Consultants, be the largest in Europe this year.

Hotel bookings in the area have been heavy and all the signs point to a record number of visitors. Organised parties are coming in Aberdeen from Denmark, Ireland, France, the Faroes, Germany, Holland, Spain and Sweden. And there will be individual visitors from many other countries.

The exhibition will be the occasion for the presentation of many products new to the fishing industry, and of others seen in Western Europe for the first time. Among these will be two smaller versions of the Japanese Koden Chromascope colour echo sounder, which will be on show on the stand of Marconi Marine.

Exhibitors will include practically everything from the boats themselves to gear handling machinery, nets and ropes, fish finding and navigational instruments, processing plant and fish boxes.

Eleven design and boatbuilding firms will be exhibiting and another 53 will be represented on the stand of West Norway Shipbuilders' Association.

No fewer than 35 suppliers of marine engines, auxiliaries, and transmissions will be represented. Ten stands will be

displaying net hauling and other machinery. Fifteen stands will be taken up by supplies of nets, ropes, bobbins and floats.

Processing is also well represented with stands by the Baader company, Arcen and several other machinery makers.

For the first time in any Scottish exhibition, Catch 78 will include large multi-company national stands. These groups Norwegian and Danish manufacturers are being organised by the Export Council of Norway and the Danish Export Association.

Exhibitors from outside Britain also come from Belgium, France, Germany, Holland, Spain, Sweden and the United States.

Catch 78 will be officially opened at 11 a.m. on Wednesday, June 14, by Maitland Mackie, Lord Lieutenant for Aberdeenshire. It will be open on each of its five days from 10 a.m. to 6 p.m., including Sunday, June 18, the final day.

The exhibition will be more than twice the size of Catch 76 in Aberdeen. Housed in two large pavilions named Aberdeen and Buchan, it will include outside displays of boats, heavy equipment and demonstration vehicles. With these the total area will be about 100,000 sq. ft. (9,500 sq. m.).

Admission to the exhibition will be ticket only. "Even so," say the organisers, it will undoubtedly be the biggest event of its kind yet held in Aberdeen. And it will not all be hard selling by exhibitors or buying by visitors. There will be many chances to relax with the biggest occasion the Fishermen's Ball which is to be held in Aberdeen's Bech Ballroom on the evening of Friday, June 16."

From ropes to catch cooling

MANY OF the stands at Catch 78 do not fit easily into any one category. They reflect the great variety of equipment available to fishermen and their industry, and also the range of products often handled by a single supply company.

An example of this is Morep Ltd. Among the products on its stands will be its range of ropes and twines, netting and wire warps.

Also on the Morep stands will be a standard fixed propeller nozzle for a trawler. Made by Hodi in Holland, this has an inside diameter of 75 inches and will be shown in combination with a Vordap propeller.

Box washer

Another product to be shown is the Universal Box Washing machine made by W. Burel of Holland.

With the interest in catch cooling systems aboard vessels, the Promac products on the Morep stands should be a focus of attention.

Besides its conventional systems, Promac RSW Nederland BV has designed a

dual purpose refrigeration system which enables vessels to have dry cargo or tank space.

"The tanks can be used as wet fish hold space," says Promac, and this changes "the economic picture since the ship's carrying capacity on boxed fish is now greatly increased."

Man sized

Removeable hatches in the tank walls open into the existing fish hold. These hatches are fitted on the inside of the tanks and are large enough to admit men carrying fish boxes.

Instead of circulating the tank water through a seawater cooler to provide refrigeration, the Promac system consists of pipes mounted against the tank sides and protected by perforated galvanised steel sheet. A secondary refrigerant is pumped through these pipes and circulates through the primary refrigeration cooler.

The tank water is also circulated, being pumped continuously around the cooling pipes to obtain optimum turbulence and heating transfer.

MACHINES FOR BLUE WHITING

THE BAADER machine developed for filleting blue whiting will be shown in public for the first time at Catch 78.

The Baader 121 is a combination heading, filleting and skinning machine. It can fillet blue whiting at a speed of 120 fish a minute worked by two operators.

This machine can also handle other small fish in the size range 24 to 40cm (9.5 to 16 inches). It is equipped to produce single skinless fillets, or single fillets or block fillets skin-on.

With a built-in bone separator, minced fish of top quality can be produced.

Baader will also show its 158 gutting machine which was designed for small fish.

Another machine on the stand, the Baader 51, skins fillets of all sizes from all types of white fish and red fish.

Small and medium fillets can be placed side by side and a throughput of up to 160 fillets a minute can be achieved.

Arcen of Sweden is

another processing machine maker closely involved in Scottish development work on blue whiting. Its machines form part of the test processing line which has been turning out surimi for marketing trials in Japan.

On its stand, Arcen will introduce its new CUS-80 machine for skinning white fish fillets (See picture below).

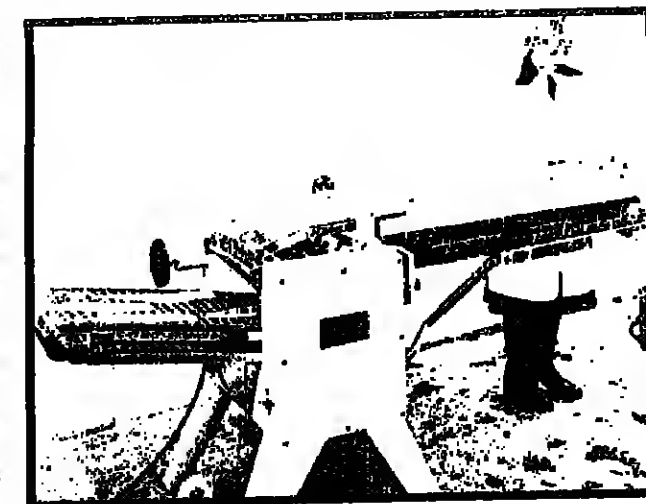
New principle

According to the company, this operates on a new principle with a fixed skinning knife and to offer important advantages "over the old method" with vibrating knives.

The CUS-80 has a capacity of 30-120 fillets a minute depending on fish size. Two fillets can be fed in side by side.

Other machines on the stand will include the SL-A-1 and the T15 mobber.

The SL A-4 processes small white fish from 25 up to 45cm and can handle about 50-60 fish a minute. The T15 heads, gills and cuts small fish such as herrings, sandies, pilchards, sprats and mackerel.



The one that gets you out of tight spots



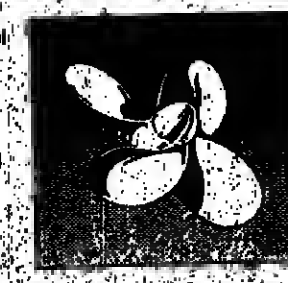
**AJAX
CPP**

SEE US ON
STAND 8700

For very high manoeuvrability—essential in confined waters, here's the system to get you out of the tight spots. Effortlessly. Responsively. Improved fuel economy. Adjustable pitch for optimum power at the selected engine speed. These are just some of the benefits experienced by fishing vessels, workboats, cargo vessels and naval craft, the world over.

Alex CPP Propellers, with their patented cycloidal cam block system, have a great deal to offer.

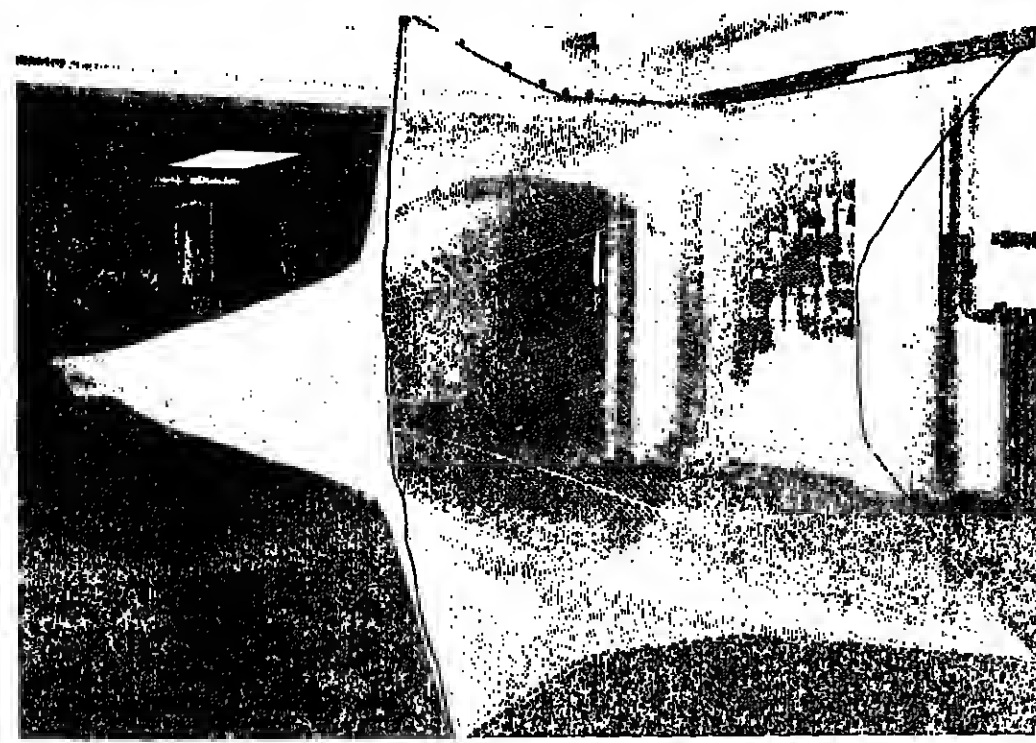
Shouldn't you find out just how much?



Full details of Ajax CR Propellers from

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AND CO LTD**

Ajax Works, Whitehill,
Stockport, Cheshire SK4 1NT
Tel: 061-480 6507-8 Telex 608513



● LARGEST of the exhibits in the Danish group of stands at Catch 78 will be a complete propulsion system by B & W Alpha Diesel AS. This will be the company's type 8V231-VO system based on an eight-cylinder vee-hull, four-stroke engine of 1160 hp.

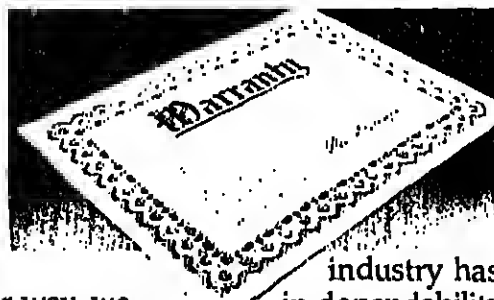
Among other Danish firms well known to the fishing industry in this national group will be Kronborg, Norskov Larsen, Grenan, De Smithske, the builders Aalborg Werft, Randersholm and C. C. Jensen. The picture shows a mid-water trawl net from another of the exhibitors — J. Christensen.

Every Gearmatic winch comes with a feature most people never even use.

Since 1972 we have paid out only about 1/2 of 1% of our total export dollar sales for warranty claims.

Or to put it another way, we have only spent a penny for warranty claims for every two dollars of sales. That tells you something about the way we build our winches.

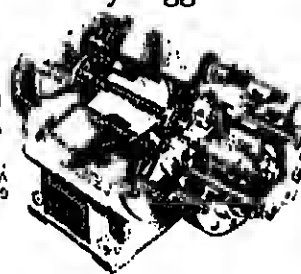
Not only are they tough but they come with gear, vane or piston motors that operate from maximum pressures of 1,750 to 5,000 psi, with line pulls of 1,500 to 44,000 lbs.



Years of designing winches for some of the toughest jobs in construction, fishing and industry has taught us how to build in dependability.

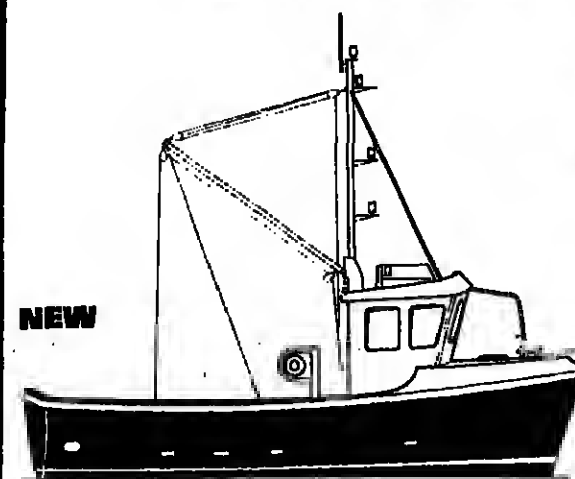
So, even though every Gearmatic winch we make may not be rugged indefinitely, they are definitely rugged.

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Skerries '24', latest addition to the range. Design: Murray, Cormack Associates. Moulded and fitted out by Halmatic (Scotland) Ltd. Ready to go to sea.

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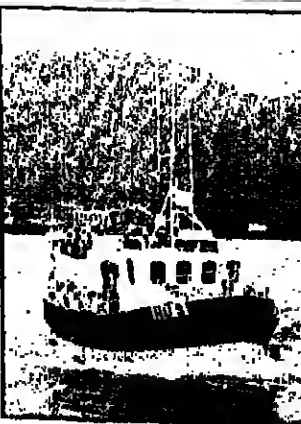
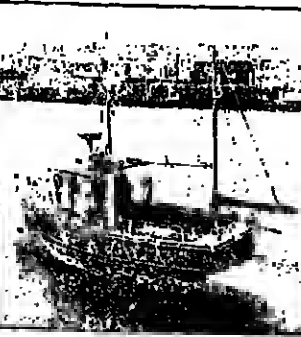
Developed and proven on one of the world's toughest stretchers of water — the Pentland Firth.

Maximum use of GRP

Hulls, decks, wheelhouses, tanks, internal mouldings, canopies, vent trunkings — even nav. light boxes.

All hulls moulded under Lloyd's supervision.

Experience proven
Top picture: Skerries '29' Calypso, Ulleval.
Bottom picture: Skerries '35' Arny, Skagstrond, N. Iceland.



Big display by 35 engine makers...

ENGINES AND associated transmission and propeller systems will be a strong feature of the Catch 78 exhibition, with some 35 engine makers and 11 firms representing transmissions, propellers and nozzles.

One maker presenting a full range of engines is the Anglo Belgian Company. And in photographic displays it will be introducing the newly-developed DZ engine. Presently available in six-cylinder form, the DZ develops 1800 hp at 1000 rpm.

Also being shown are the company's 3, 6 and 8 cylinder in-line DZ engines from 185 to 1200hp.

Cummins will be launching a new engine. This is the NTA-855-M developing 325 hp a turbocharged and aftercooled addition to 855 range.

On the stand at Aberdeen, visitors will see the 275hp NT-855-M, a compact lightweight unit with a choice of PTO positions.

Dorman Diesels will show the 12JTM 384 hp vee form 12-cylinder marine engine. Units made by this company range from 30 up to 735 hp.

Perkins Engines will highlight the 4.236 diesel on the stand of its Scottish distributor. Suitable for small inshore workboats, the engine develops 72hp at 2500rpm.

From France

From its range, the French company SSCM will be showing a Poyaud model 12V85M engine of 800hp at 1500 rpm. The engine will be complete with gearbox and propeller. Also to be shown is a Poyaud 6-cylinder in-line engine developing 330hp at 1500rpm.

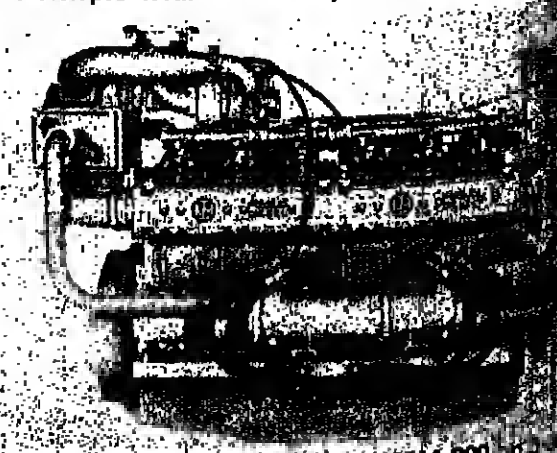
Of particular interest in the Swedish Volvo Penta exhibit will be the ingenious Y drive which has doubled the power available from the company's engines.

It couples two engines to one gearbox, taking the maximum Volvo Penta power available up to 580hp. Introduced two years ago, the drive has been subjected to intensive testing and many units have run for more than 3,000 hours trouble free.

The Y drive on show in Aberdeen will be coupled to two 290hp engines. Other engines to be shown will be the 30hp MD17C, heavy-duty diesel, the 106hp MD70B, the 195hp TMD100A, and the 260hp TMD120A.

R. A. Lister Marine will feature the new JWSC6M 250hp engine coupled to a Hundedest controllable pitch propeller.

Developed from the suc-



From France, the Poyaud 12V85M 800

CATCH '78

successful JW range, this engine is turbocharged and intercooled continuously developing 250hp at 2000rpm. According to Lister, many of the design features of the JW range have been retained although power to weight ratio has been greatly improved.

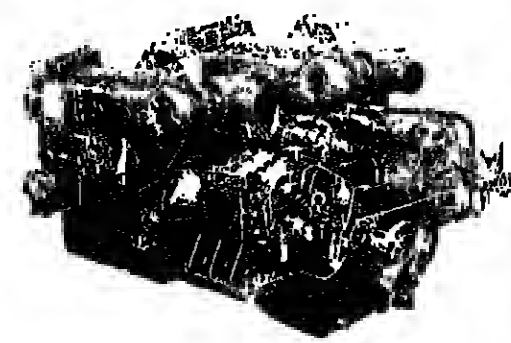
Also on the stand will be an R. A. Lister 25kW generating set, a water-cooled 30hp propulsion engine; an 88hp engine; an air-cooled 30hp engine; and two generating sets of 6.25kW and 1.8kW.

The Newage H2P two-pitch propeller system (which was featured in FNI in May) will be the main exhibit on the stand of the company's Marine Propulsion Division. Suitable for trawlers in the 150 to 900hp range, H2P systems incorporate a propeller with two blade pitches. Alteration of pitch is done from a simple control in the wheelhouse.

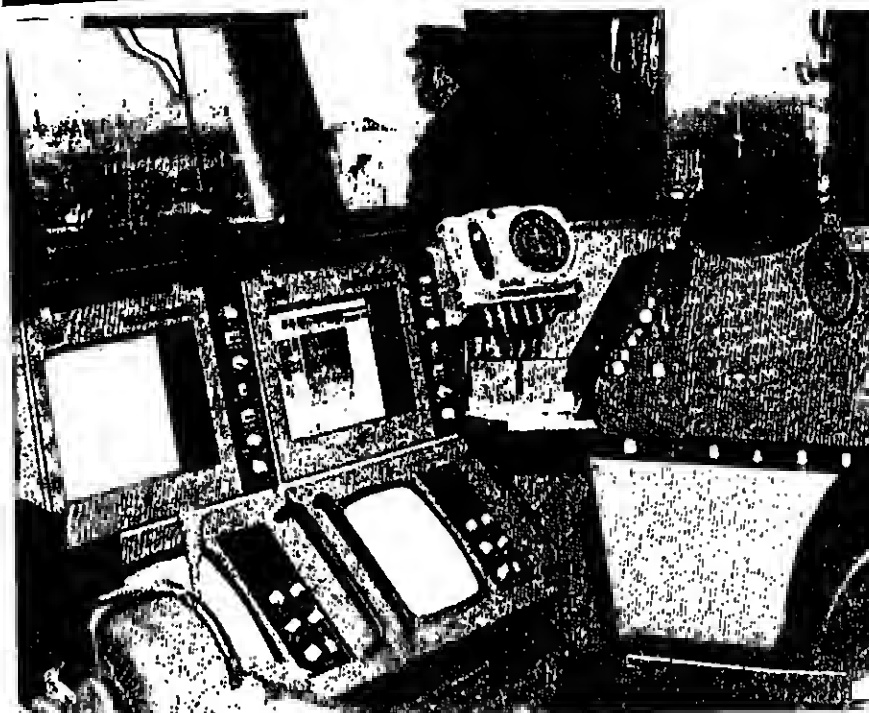
Simplified

Newage will also show its IMA (inside mechanically adjustable) propeller system. This is a simplified version of the two-pitch system. It uses the same propeller and hollow tailshaft assembly but is fitted with a mechanical actuator. With tailshaft stopped, simple crank handle is inserted in the actuator to adjust blade pitch to coarse or fine. An indicator is provided to show the vessel's optimum pitch angle positions.

For its main exhibit, Bamford & Co. will show a cutaway working model of its Ajax controllable pitch propeller system.



Volvo Penta 290 hp engine coupled to a Y drive. This ingenious device doubles the power available from the engine.



Atlas echo-sounders and radar in a German trawler.

Nets, winches and fish finders

AMONG the net makers at Catch 78 will be W. & J. Knox of Kilbirnie in Scotland. The company celebrates its 200th anniversary this year and is commemorating the event in Aberdeen with displays of some of the most up-to-date nets for the industry.

Products on show will include Gourcock trawls, gill nets from a variety of materials, and cod wreck nets. These wreck nets are of particular interest at the moment, says H. A. Ford,

Knox sales manager. "For a number of years now we have been supplying the Danes, the acknowledged experts in this field of wreck fishing. We can supply either sheet nets or fully rigged nets at very competitive prices."

The company will also show fish farm cage netting, flotation units and a comprehensive range of fishing lines.

Among the electrics to be seen on the stand of Lucas Marine will be the Danish Transmotor range of marine rotary converters, alternators, and DC and AC generators.

The Parsons Chain Company will show its Trawlax range of alloy steel chains and fittings. To be seen for the first time at an exhibition will be the new Midlink Trawlax chain. While this is just as strong and hardwearing as the traditional chain, says Parsons, it is 16 per cent cheaper.

Successors to A. W. Smallwood, Colts Engineering make hydraulic deck machinery, including seine capstans, net drums, and trawl winches up to 25-ton mid layer pull.

The company will be showing its 6000 trawl winch together with pot and line haulers.

South Western Mechanised Fishing makes hydraulic net

drums up to 24 tons. A new product is its 7.5-ton multipurpose net drum with clutched drum and warping capstan.

Among the many displays of fish finding equipment, one of particular interest should be the new fishing sonar model 950 which Krupp-Atlas Elektronik is showing for the first time.

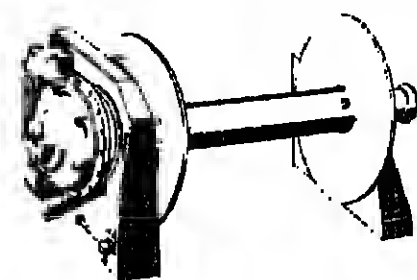
For this sonar, Atlas uses what is described as rotational directional transmission pre-formed beam techniques (RDT/PFB) resulting in a sector of 90 degrees covered by 12 beams transmitted simultaneously.

In this way, the target information content obtained by one ping is about ten times more than with a normal

searchlight sonar. As a result, says Atlas, the scanning period is drastically shortened.

Target signals received are stored in a digital storage unit and displayed on a large 44cm CRT steady daylight PPI display.

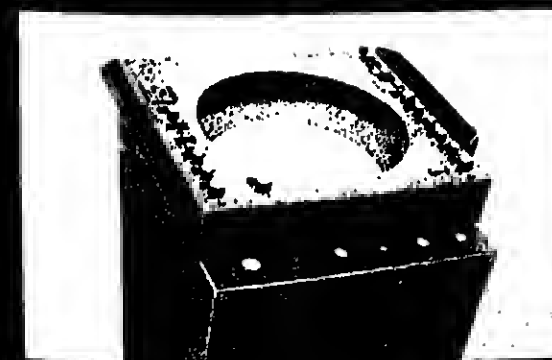
Atlas will also be presenting a new development of its Fischfinder series of echo sounders. A completely new indicator has been designed for the series model numbers 721/781 and 791/DS. Features include six basic ranges 20 to 1000 metres, continuous phasing bottom locked scale expansion, automatic grey line and digital indications of depth, ranges and towing time.



The new 7½ ton hydraulic net drum from S. W. Mechanised Fishing.

KRUPP
ATLAS-ELEKTRONIK

ATLAS Rugged Radars.



16" Rugged Radar ATLAS 6500 BCA Superviso in 25 kW (X) and 30 kW (S) Solid State Quality. Super target discrimination. The optimum for your way of fishing. The excellent radar for the successful captain.



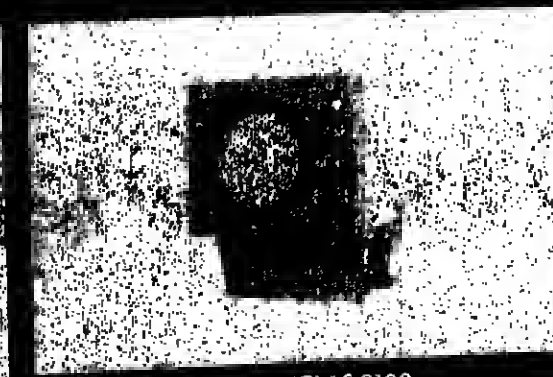
12" Rugged Radar ATLAS 5101/5300/5500 The most favoured trawler radar. Standard with plotter, plot-clock and VRM. The superior S band version ATLAS 5500 S with 30 kW transmitter.



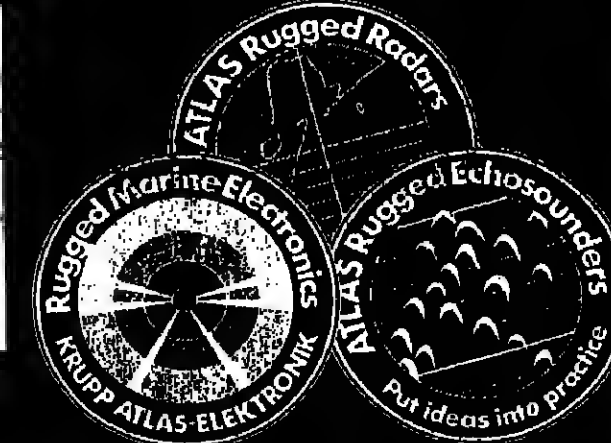
9" Rugged Radar ATLAS 4101/4300/4500 Now even more powerful: ATLAS 4101 with new 7.5 kW Tx UP ATLAS 4300/4500 with proven 7.5/25 kW Tx DOWN. Upper class radar options available: VRM, NSP, TBS. 8 ranges from 0.3 out to 48 nm.



9" Rugged Radar ATLAS 3200 The ambitious small vessel radar with the brilliant picture. Advanced two-unit radar with 4 kW Tx UP reducing installation costs. Solid State technology. 8 ranges from 0.25 out to 32 nm. Simply super.



6 1/2" Rugged Radar ATLAS 2100 Complete with 8" lens and 6 ranges from 0.5 out to 32 nm. With 4 kW Tx UP and a proper pack of professional characteristics. The razor sharp picture gives you a feeling of confidence.



What ever on-board practice may require — you can turn to KRUPP ATLAS ELEKTRONIK for it. Advanced and rugged equipments will meet with your approval.



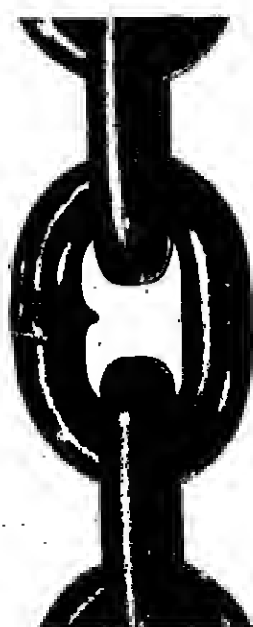
Good grounds for choosing Dragalloy.

Wherever the going is tough you'll find Dragalloy, serving skippers throughout the world, helping them take good catches, make good profits. Since its introduction in 1969 Dragalloy has been at the forefront of the industry. Proven handling qualities and long life make Dragalloy what it always was — the leader.

DRAGALLOY FACT.

1.

Dragalloy's round link pattern gives maximum resistance to snagging due to its close coupled configuration. Wherever you are in the world there is a Dragalloy distributor near you.



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CATCH '78'
See us on Stand B652
ABERDEEN INTERNATIONAL FISHERIES & MARINE EQUIPMENT EXHIBITION
14th-16th June 1978

ECONOMY-CLASS BEACH CATAMARAN

OUTSTANDING among the exhibits at the Catch 78 exhibition will be the brand-new small fishing catamaran *Sandskipper*. It will form part of the display of Petter Marine Diesels where one hull will be shown together with the boat's 6 hp Petter diesel engine.

The whole boat, complete with sail and all fittings, will be seen in Aberdeen harbour, where it will be available for demonstration trips. It has only just been completed and ran successful trials on May 23.

With a length overall of 7.5 metres (24ft.), a beam of 3.75m (12ft.) and draft of only 0.4m (1ft. 4in.), the *Sandskipper* is a smaller version of the Catfish 36 developed over the past ten years by Edward and Joyce Gifford, who now run the firm Catfish Ltd.



A Catfish 36 catamaran is now working well off the beaches in Ghana (see *FNI*, May 1978) and beaching landing in developing countries is the market aim for the *Sandskipper* design. "The use of conventional inshore is quite impossible in many countries," says Gifford, a civil engineer who became interested in beach-landing methods after taking part in the FAO Conference on Fish Port and Markets in Bremen in 1968. This is because of the high cost of maintaining harbours on open beaches.

If local fishermen are to be given the chance of improving their catching performance, therefore, they will need boats and boat handling methods suited to beach landing.

The Catfish 36 is a trawler, purse seiner, gill-netter or line boat that can work from open beaches through three metres of surf. But it cannot be an immediate successor to the canoe for most village fishermen because its capital cost is beyond their means.

Whole range from Norway

FROM DESIGN through boats to fish finding, catching and preservation, the Norwegian group of stands at Catch 78 covers just about the whole range of fishing activities. Design is represented by Skjuteknisk, whose recent projects include the largest purse seiner for Denmark and "the largest and most contracted purse seiner for Scotland." This is to be delivered in May 1979.

West Norway Shipbuilders Association will feature the facilities and services offered by its 53 member yards.

Fish finding will be amply covered on the Siurad stand, which will show the latest instruments in the company's range of echosounders and sonars. New in the industry is the SV automatic sonar designed for small and medium size vessels and offering eight ranges from 75 up to 1500 metres.

Giant mackerel net

Norsenet has supplied the British market with purse seine nets since 1968. Its deliveries in recent years included the 350 by 100 ft. mackerel net for the purse seiner *Chris Andra*.

The firm's net loft in Egersund is also known for its trawl nets. Among these are the Hoover and Octopus — an industrial fish's system used by fishermen in most North Sea countries.

Trawls from the factories of Norsenet's member companies were used by many of the high catching ships in the recent record blue whiting season.

Hooks will be shown in stand of O. Mustad and Son, but the main attraction will be the presentation of components of the Siurad Autoline system for mechanised long lining.

Bergens Mekanske Verksteder will show its Norwinch deck machinery, including its hydraulic motor and power transmission control system. This was developed to meet the need for a flexible "kick power transmission" aboard fishing vessels.

Norwinch hydraulic systems for trawl shooting, braking and towing will also be presented on the stand.

Karmoy Mek. Verksted, builder of the Scottish purse seiners *Chris Andra* and *Talts*, will show examples of its range of winches for trawling and purse seining, its net drums and its submersible fish pumps.

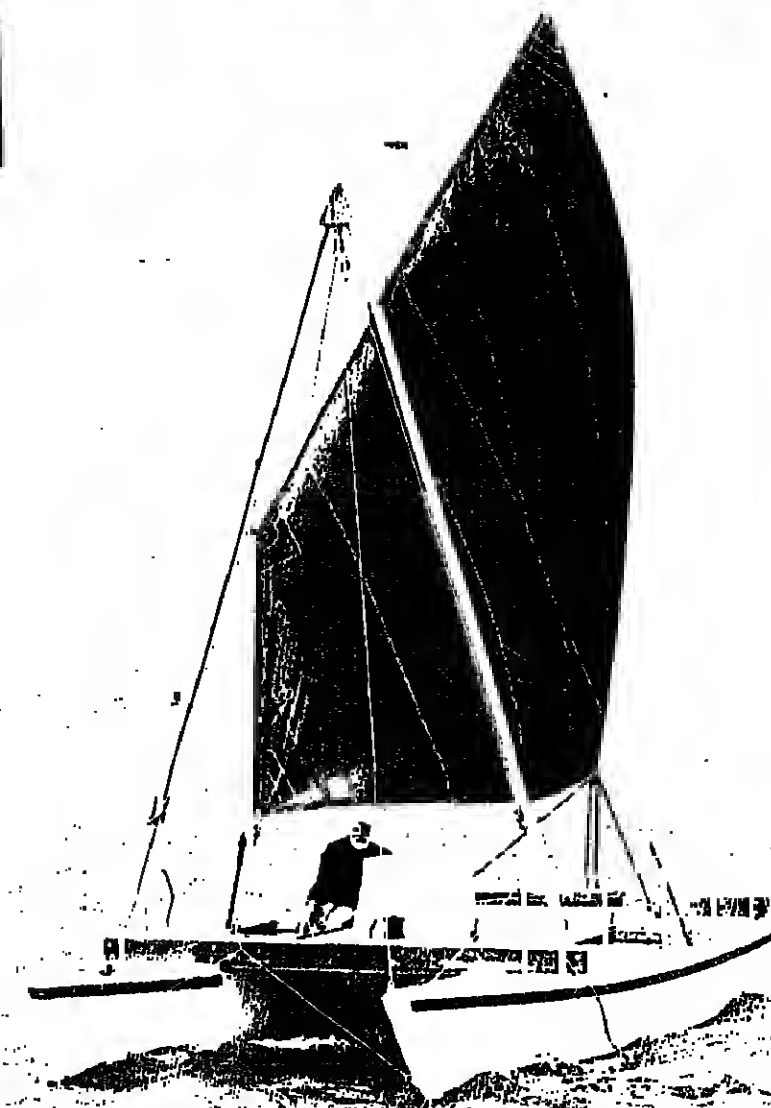
Automated fishing

Also in the winch field, Hydraulik Brattvaag will demonstrate its Synchro systems which allow a considerable degree of automation in trawl fishing. The Synchro 1020, for example, is designed for pelagic trawling. This permits hydraulic braking during shooting, automatic shooting and hauling of the warps to a preset length, and depth adjustment by warp tension control.

A new plastic trawler box specially designed for the industry in the past two years, this company has supplied 500,000 boxes in Northern Europe.

The increasing interest in RSW systems should bring many visitors to the Kvaerner Kude stand. This company has fitted out the systems in most of the new purse seiner/trawlers which came through the years on several different species of fish. Kvaerner will show its horizontal plate freezers.

Pineam Industries produces ice plants for ship and shore use. It has delivered two plate ice plants to Scotland this year, both able to turn out 50 tons in 24 hours.



Designer Edward Gifford sails the *Sandskipper* on her trials last month.

Sail power

For this reason, the smaller and cheaper *Sandskipper* has been developed. And one of its advantages is that it is designed to be powered by sail as well as by a small diesel engine.

In its prototype form, the *Sandskipper* carries a sail and is equipped with 6 hp Petter diesel driving a "long-tail" shaft. The engine can be supplied in a basic form turning a 350mm (14in.) dia. propeller through 3 to 1 belt reduction. The aim, says Gifford, is the most economical power propulsion at the lowest capital cost.

But for fishermen wanting faster boats or greater towing capacity, larger engines can easily be fitted. One layout would consist of a 12 hp Petter twin.

Engine and shaft are mounted on a frame resting on trunnions on the bridge deck between the two hulls. When required for propulsion the shaft is lowered by a rope block and tackle. In raised position, the engine can engage with an adapted Fairley Engineering winch for net and line hauling. The winch also has enough power to haul the boat up the beach.

From experience with the

Catfish 36, the designers calculate that the *Sandskipper* should carry about one ton of fish and gear and be able to negotiate a surf up to two metres in height. The layout can be adapted to many forms of fishing.

GRP-built

Construction is at present in GRP using C-Flex, "which is a convenient method for the eventual construction of the boat in developing countries."

It is expected that the economical method of providing these boats will be found to be by local construction.

One reason for this is that freight costs of exporting the boats from Europe will substantially increase their price.

In addition to the *Sandskipper*, Petters will be showing a range of their small engines. The Marine Division produces air or water cooled units from 6 hp up to 45 hp suitable for fishing boats up to 12.2 metres (40ft.) in length.

Petter's marine generating equipment will also be shown. And there will be a Petter Refrigeration DFM transport refrigeration unit which can be installed in insulated vehicles for carrying fish.

KG 15

A collapsible chair very strongly made, and especially manufactured close to the hullhead in port or starboard side. In particular construction makes it possible to place the chair anywhere in the wheel-house where a maximum of space is available.

SL 50/H

With grab handle on top of the back support. The one to choose if available space permits.

SS 25/H

Designed and built especially for vessels with limited space in the wheel-house but not collapsible.

SK 30/H

With grab handle on top of the back support. The chair is collapsible.

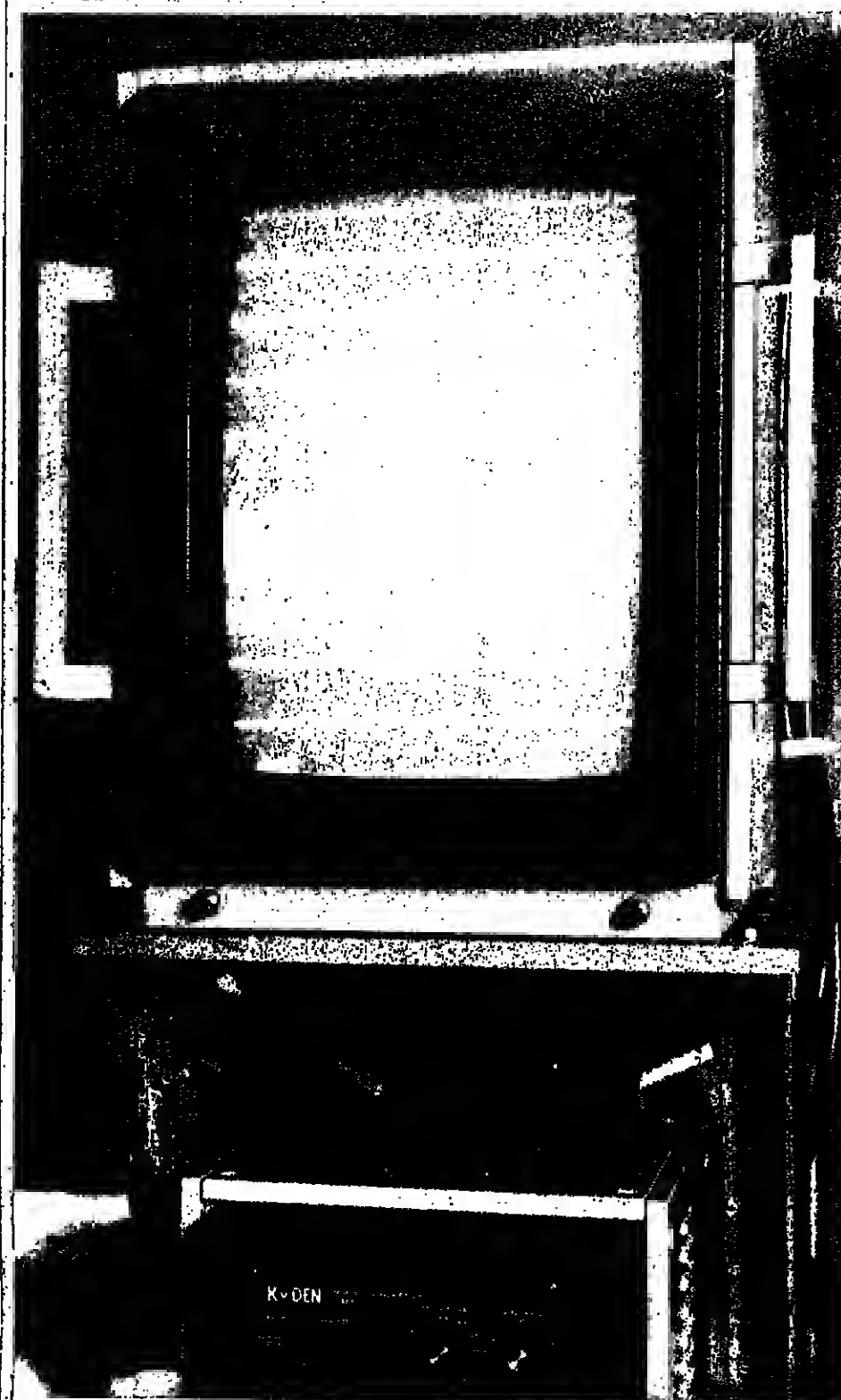
the one with the red back...

Skipper

Sales and manufacture: **e-vejvad hansen**
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STAND No. 333A, CATCH '78, ABERDEEN

HOLBERGS ALLÉ 25 - DK-6700 ESBJERG - DENMARK - PHONE (061) 13 19 18 - CABLE: SKIPPER/HAIR ESBJERG



Looking rather like the screen of a colour television set, this Chromascope K1 echo sounder displays a heavy concentration of fish located by the British trawler *Arctic Raider*. The concentration appears to be most dense at the top of the shoal, which reaches from just above the seabed to near mid-water. The horizontal white lines are depth scale markings. Echoes from small fish and plankton near the surface appear as white spots at the top of the screen. Part of the control panel and transceiver can be seen below the screen.

FINDING FISH — IN COLOUR!

VISITORS to the Marconi Marine stand at the last Catch exhibition in Aberdeen, in 1976, could learn about the Kodon Chromascope K 'colour TV' fish finding echo sounder only through pictures and leaflets.

But this revolutionary new sounder is now in full production. As the agent in the UK and Ireland Marconi will be showing the original K model plus two other Chromascope sets suitable for smaller vessels.

The first British installation of the Chromascope K has gone into the trawler *Arctic Raider*. The two skippers who have used it, C. J. Hunting and T. Smith, say they are well satisfied with the results.

This initial instrument will be prominent as a working demonstration at Catch '78. Intended for the larger distant water ships, it is now to be known as the Chromascope K1. The two smaller models are the Chromascope K3 and K5.

These work on the same

CATCH '78

TWO of the most interesting displays at the Catch '78 exhibition in Aberdeen will feature wheelhouse equipment announced and known for some time, but which has only recently come into regular use in fishing vessels. BILL MACONACHIE describes the Japanese Kodon company's remarkable colour fish finding echo sounder and the Norwegian Robertson SKR80 electronic gyro compass.

principle as the K1 and provide much the same information on a similar type of display. The main differences are in the screen sizes and depth ranges covered and in power consumed and transmitted.

Gradations

In the Chromascope range, reflected echoes are displayed on a rectangular TV-type screen in eight colours, each with two different gradations of tint marking an equivalent of 16 shades.

The Chromascopes are all-

electronic with no moving mechanisms. The "recording" — if one can call it that since it is in effect a moving picture — is traced horizontally across the screen at each sounding to produce an image in natural configuration with the surface at the top and the seabed at the bottom.

The colours and their tint clearly distinguish between seabed, water, fish and other echoes. For example, the water is shown in blue, the bottom in deepred, and fish and other targets in shades of orange, yellow, green and white according to their size or density and the consequent strength of their return echoes.

A dense shoal in midwater will therefore show almost as dark as the seabed itself while plankton and other minute organisms or "noise" are seen in white; heavy concentrations of fish on or near the seabed, though both are red in colour, are clearly distinguishable from the bottom echo in a manner superior to the white line separation of the conventional sounder.

Easier

The whole scene beneath the vessel is thus displayed in a form much more easily interpreted than on a monochrome paper record. Although I have referred to it as a moving picture, the display can in fact be "frozen" at any time for closer study of that moment. Also, if a permanent record should be required a video-tape recorder or an instant-print type camera, or both, can be supplied as optional extras in store displayed information for playing back later. There is of course no paper cost with the Chromascope sounders.

Electronic gyro compass

IN THE autumn of 1976 Robertson A/S of Egersund, marine electronics arm of Norway's State-owned Kongsberg Vopentfabrikk concern, introduced the prototype of the world's first electronic gyro compass designed for marine use. The company expected to begin delivery early in 1977.

This proved to be a somewhat optimistic forecast but production of the SKR80, as it is called, is now in full flow. Some 20 installations are already in use at sea in various types of vessel and orders for many more have been booked either direct with Robertson or through agents such as SAIT Electronics who have the British marketing rights for Robertson products.

The SKR80 is very compact, not much more than one foot cube in size, and weighs only 17 kg. In the DC version and 20 kg, when supplied for operation from AC mains.

Its design is the outcome of co-operation between the Kongsberg Division of Slinger Aerospace and Marine Systems, USA, and

Robertson, resulting in the Kongsberg Marex gyro, which has for some time been extensively used in aircraft navigation systems, becoming the basis for the SKR80 which Robertson designed around it.

With such dimensions and weights, the SKR80 is very considerably smaller and lighter than the conventional gyro compass. There are no flotation liquids, ballistics, gears or mechanical links. No aid to cooling such as a fan is necessary, the fluid sides of the casing coping comfortably with the radiation of internally generated warmth.

Not required

Correction charts are not required since compensation for speed and latitude errors is done by separate controls on the panel, and the instrument is suitable for use at speeds up to 40 knots. Settling time from switch-on is from 12 to 20 minutes, procession being effected by mini-controls instead of by mechanical means. Once installed, no further on-board

calibration or re-calibration is necessary, even after long shut-down periods.

Both installation and operation are simple. Controls on the panel above the 6.5 inch compass card are the hemisphere switch (North or South), latitude setting (0-80 degrees), ship's speed input, illumination dimmer, and slew control knob for rapid initial alignment of the compass card to the closest estimate of true heading in order to reduce the time taken for absolute alignment.

The SKR80 has one further control, a switch with three positions one of which is OFF while the others are labelled NAV and DG respectively. The NAV setting has the unit operating in the normal mode as a North-seeking gyro compass aligned along the meridian. Switching over to DG puts it into a directional gyro mode in which it is least sensitive to large dynamic inputs such as are imposed when manoeuvring at high speed or sailing in heavy conditions involving severe yawing.

Status lamps to indicate power on, acquisition of the meridian and stabilisation in

the navigation mode are mounted in the control panel which also displays the heading in a four-figure digital LED readout correct to one-tenth of a degree.

Repeaters

An SKR80 installation can have up to six analogue repeaters and six digital repeaters at remote locations such as bridge wings or cabins, or interfaced, as they can be, with most automatic direction finder, radar, Loran, Omega and satellite navigation systems. The SKR80, naturally enough, can also be used with Robertson's own AP-7 autopilot.

Capable of operation from either 110-220V AC or 24V DC, the SKR80 is designed to maintain accuracy in ambient temperatures from 0 to 55 degrees C, and to meet the requirements of the IMCO performance standards of 1973, Det Norske Veritas, and the Norwegian Maritime Directorate.

The SKR80 electronic gyrocompass will be on show in Aberdeen on the stand of SAIT Electronics.

All three models have bottom lock and range expansion facilities and can present four types of image — normal or full depth; range spread; bottom spread; and above or below the head rope. These four different images can thus be shown simultaneously on the screen synchronised with information on depth, range expansion, net monitor, water temperatures, etc.

Depth scale lines can be superimposed across the screen and time intervals are shown as white dashes one minute apart across the foot of the display.

Ten parts

In the Chromascope K1 and K3, the depth scale lines divide the screen into 10 equal parts and a four-figure digital readout indicates the depth at three positions — oscillator or transducer depth, image centre, and seabed. In the new smaller K3 and K5 there is also a variable depth marker which can be set on any target such as the top, centre or foot of an observed shoal and the digital readout then shows the depth to which the marker has been adjusted.

Dual frequency transducers are incorporated in all three versions of the Chromascope K's to give the user a choice of high or low frequency operation. In the case of the K1, this can be selected from the range 200, 50, 28 or 14 kHz; in that of the K3 any two can be chosen from 200, 75, 50, 28, 24 or 14 kHz; while the K5 offers a choice of two frequencies in the range 200, 75, 50, or 28 kHz. A switch on the display controls the frequency changeover.

Power

The transmitted power of the original Chromascope K1 is 10 kW, the K3 has a power output of 4 kW on low frequency and 2 kW on high, and that of the K5 is 1 kW whichever frequency is employed.

Depth ranges of the K1 are from 0-25 to 1,000 fathoms in 11 switched steps while portly enlarged images can be displayed in five steps of 2.5, 5, 10, 25 and 50 fms and headrope images at intervals of 5, 10, 20, 40 and 80 fms. Although the maximum depth for this model is graded at 1,000 fms, by setting the

transmission level at the appropriate depth soundings can be achieved down to 5,000 fms with the ample power.

The K3, with its lower transmitted power, sounds down to 2,000 fms maximum in 10 ranges starting at 0-25 fms and on its 16-inch screen partly enlarged images can be displayed at 2.5, 5, 10, 25 and 50 fms.

Both the K1 and the K3 have their transceiver unit, separate from the display and its control panel, but the K5, the smallest Chromascope and the one most likely to appeal to middle and near water fishermen, has its transceiver built into the same cabinet as its 11-inch screen. The two bigger versions require a power supply of either 100-110 or 200-220 V AC, but the K5 operates from a DC source of 12, 24 or 32 volts and can thus be battery-powered with a consumption of only 130 VA maximum.

Depth ranges

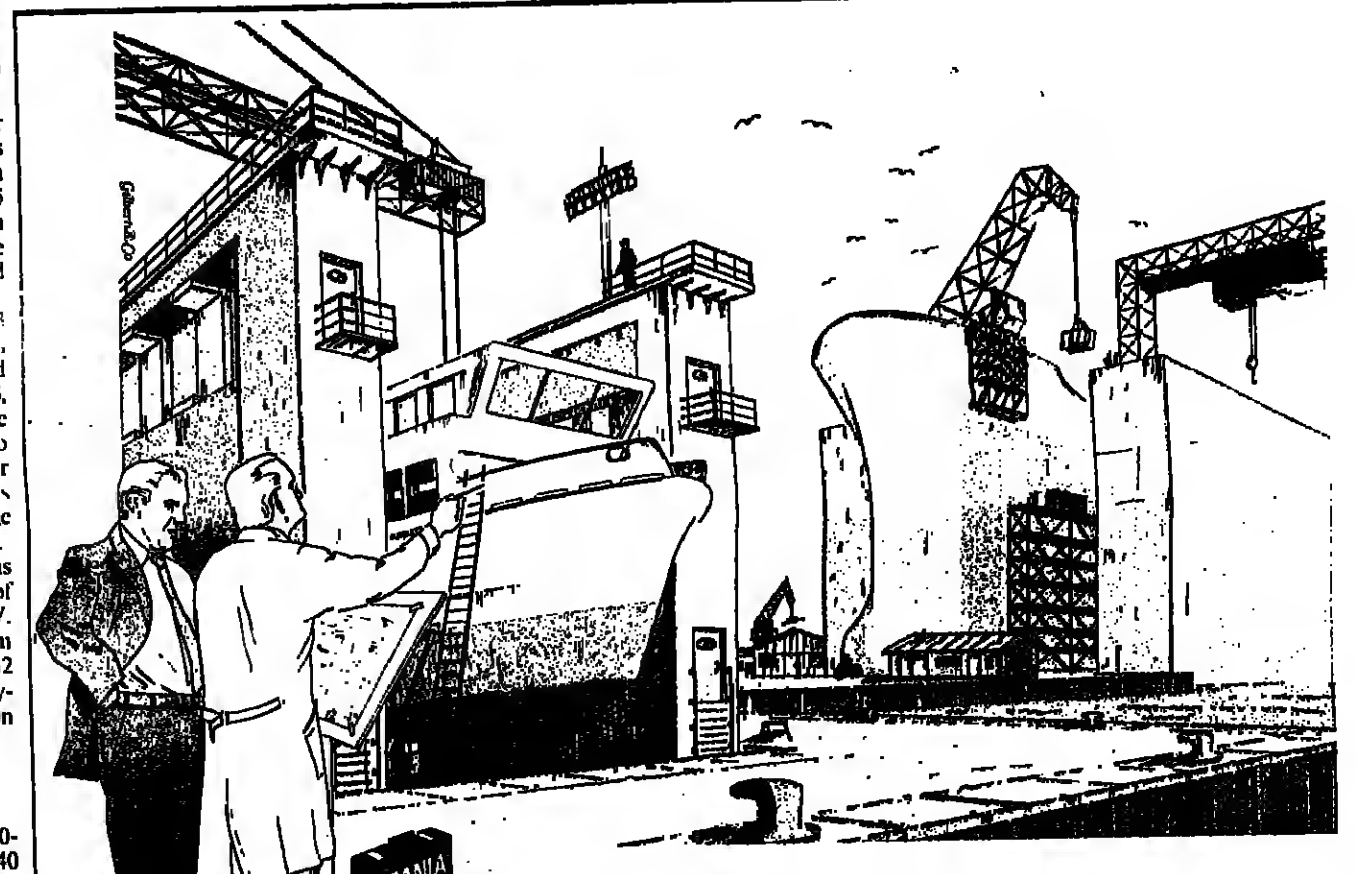
Its depth ranges are 0-40, 0-80, 0-160, 0-320, and 0-640 fms, with partly enlarged images capable of being displayed in four stages of 10, 20, 30 and 40 fms.

The K5's integration of transceiver, display and control panel in one unit makes it very compact, approximately the same size as the Fishgraph K recording sounder which is now coming out in an improved version using micro-processors instead of transistors as before.

Murcon will also be showing selections from its range of marine communications equipment. These will include the Transoceanic Atlantic and Pacific combinations of transmitter and receiver, the Warden III watchkeeping receiver, and Coastcall single frequency and Sencall multi-frequency selective callings systems.

A radio telephone on show will be the VHF solid-state Corvette SS which can be supplied with 61 or 117 channels.

Another instrument to be displayed is the Forecaster K weather facsimile receiver. This gives large clear reproductions of weather charts. Radar equipment will be represented by the Radiolocator 127, a solid-state radar with a range of 60 miles, and the MD505 IIS fisherman's radar.



Scania is around where the 80's are planned

Ships of all kinds need powerful and efficient engines that are economical and reliable in operation. Engines that will have to manage hard work, often with high continuous output. Engines, perfectly adapted to their duties to give maximum power.

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ing-boats or ferries all over the world have Scania diesels for power. Scania diesels are used in single and multi engine installations for propulsion, cranes, pumps, gensets and other kinds of equipment.

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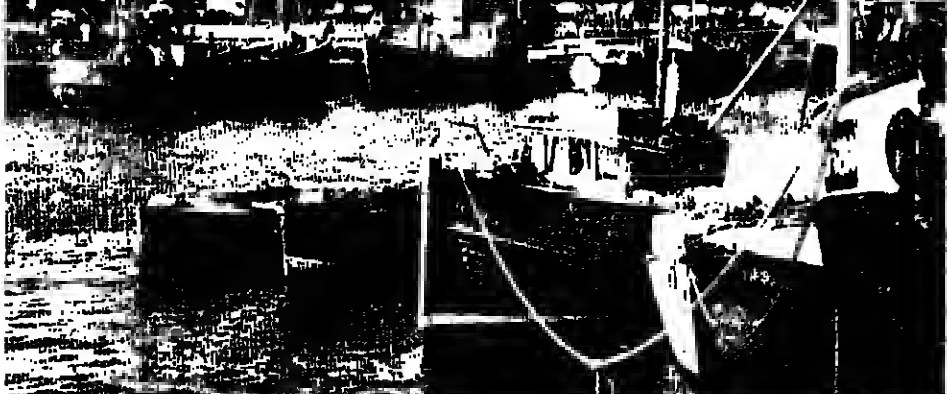
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PORTS & MARKETS

BUSY HARBOUR AT THE CROSSROADS



Fishing boats in Bangor harbour in North Wales

THE SMALL harbour of Bangor on the tip of North Wales is thriving — in fact, it is doing so well that its annual turnover has risen to a third of a million pounds and there are plans for further development of the harbour, writes DAVID WATKINS.

The port itself was developed by the local quarry magnate Lord Penrhyn. He exported slate from Bangor to all parts of the world and ever since, the harbour bears the name of Lord Penrhyn.

But port and harbour had become derelict until in 1968 an ice-tower was built to produce three tons of ice a day. This was made possible by a grant from the government to develop the industry and in particular that of Milford Haven in the southern part of Wales.

Celtic Fisheries then came to develop Bangor harbour further after seeing how strategically placed it was. Bangor lies right on a busy road to London and on an equally busy route to the English Midlands. There is also a railway station near the town centre where fish can be dispatched quickly to the furthest markets in the country in no more than six hours.

Catches brought into Bangor harbour in the morning are guaranteed to be on sale even in the markets of Boulogne in France in less than 16 hours thanks to an arrangement with British Rail.

Bangor harbour has much to offer fishing vessels from all parts of Britain. Dock charges are low — only four pence a stone (14lb.) for a landing levy. Again, the harbour can provide ample fuel, ice, water, dockside electricity and safe anchorage for ships. And there is 20 tons frozen fish space in the harbour as well as 12 tons chilling space.

Regular

More and more fishing boats are using the harbour to land their catches. As it develops, vessels come from north and south Ireland, the Isle of Man and also Scotland and on a regular basis.

Dutch trawlers also make use of Bangor harbour since other ports tend to be more overcrowded and have higher landing charges. And there is even contact with America, for 15 tons of queen scallops are processed every day. They are blanched and sent to Milford Haven for packing and then on to Southampton for their journey to United States markets.

In addition, there is a very lucrative market for fish in the area. Some fish is sent to Milford Haven for smoking and around a ton a month returned to Bangor for the local traders.

Bangor harbour is only a part of the Celtic Fisheries complex. It is in close connection with the older

Stocks out to ease prices

THE Sri Lanka Government is to launch a three-pronged drive to bring down fish prices. The Fisheries Corporation has now started releasing quantities of fish from a buffer stock of 34,000 tons.

The stocks will be sold at reasonably prices only on a retail basis. The Corporation's buying staff have started to purchase at least 75 per cent of the fish caught in the country.

Fisheries Minister Festus Perera told fishermen that unlike the past, the Fisheries Corporation would now pay cash on the spot for any amount purchased. Previously fishermen had to wait for months to receive payment.

Clean up

The Minister said it took him some time to clean up the "stench of rotting fish" in the Corporation. Riddled with corruption and inefficiency, it had only Rs.50,000 when he took over. Staff salaries alone amounted to Rs.800,000.

Like many other corporations, the Fisheries Corporation became an empire to some individuals and it took a lot of hard work to clean up the mess, he said.

NEW RANGE

BIRDS EYE has increased its range of battered fish products. Called crispy place bites, the new range consists of slices of filleted plaice dipped in batter and aimed at children and adult main meals as well as starter dishes and party snacks. They come in a single 600g (1lb. 5oz.) size. Birds Eye claims a significant growth in its sale of the crispy range in retail and freezer packs last year.

Birds Eye has also decided to relaunch its smoked fish products, hitherto kipper fillets and battered smoked haddock in new packs. The company is also test-marketing a range of battered kippered mackerel due to the short supply of herring. For natural fillets, Birds Eye has made changes to the products themselves, with a new 10oz. presentation. The company is spending up to 30 per cent more on raw materials for this, using top quality cod and instead of codling and larger plaice and haddock.



PERU SEEKS FISH COMPANY BUYERS

PERU'S Minister of Fisheries, Vice Admiral Francisco Mariategui, has said that catches for reduction to meal and oil are expected to amount to about 1.5 million tons during 1978. But these will have to be found almost entirely among species such as sardines and mackerel. Fishing for the much-depleted anchovy is not likely to be allowed this year.

The Minister also announced that the government had received offers from four groups of local businessmen to buy 80 per cent of its shares in Pepesca, the fish canning and processing company in the Paita port complex.

Although no price was set for Pepesca, it is believed that the groups bidding for its shares had to prove they had financial backing for the equivalent of at least \$8 million.

Also on the market are 80 per cent of the shares in the Paita-based Challa del Peru (Challapasa).

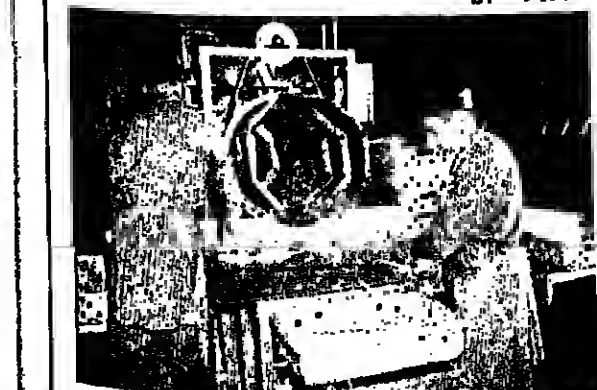
Challapasa was, until early in 1978, operated by the government in partnership with the Japanese companies Mitsubishi, Taiyo, Gyogyo and Nihon Hogei. It is now in liquidation.

Freezing plant

At its Paita factory, the company has an installed processing capacity of 6706 kilos an hour. The factory includes a freezing plant and extends over 16,120 square metres. Its main products were frozen merluza and minced fish (surimi) for fish sausage meat.

The company operated with a work force of 400 people.

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Boxes for Scottish fish factories

JAMES CORDINER & SON LTD. of Aberdeen, Scotland, claims to be one of the largest solid board fish box suppliers in Britain after taking on Ashton Containers' "Viking" boxes in Scotland two years ago.

These solid fibreboard boxes, which are coated with polyethylene to make them moisture-proof and non-absorbent, have captured a major share of the smaller box market from wood and polystyrene containers.

Viking boxes are available in 7lb. (deep or shallow), 14lb. (deep or shallow), 14lb. stone export (19in. long, shallow), 28lb. and 42lb. sizes.

Cordiner erects, stitches and prints the blanks — made by Ashton Containers Ltd. — for delivery to fish merchants and processing plants in Aberdeen, Peterhead and many other Scottish ports.

James Cordiner supplies Viking boxes, in either small or large orders, with fast delivery times — usually on the day of order in cases of

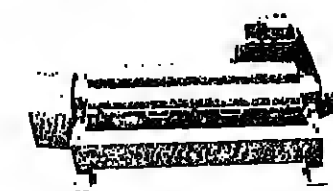
unprinted boxes. This is a vital factor in the smooth running of an industry which cannot buy even 24 hours ahead, due to the variations in catches and in types of fish, as well as lack of storage space.

A member of Cordiner's sales staff is permanently based at Aberdeen harbour. In addition to actually selling containers, he acts "as an unpaid stock control manager." It is his job to ensure that customers have boxes available when they need them.

"This approach has proved to be a cornerstone of our success," says director Stephen Cordiner, "as customers can need Viking boxes at very short notice." This is emphasised by the speed of landing and auctioning catches. For example, boats arriving past Aberdeen Roundhouse before nine in the morning can have their catch landed immediately when they reach the quayside. The catch is then auctioned, in sequence of unloading, to some 200 Aberdeen fish merchants and processors.

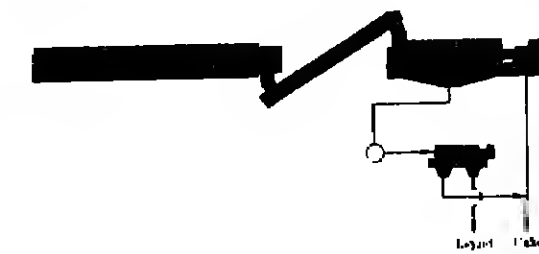
A selection of the Viking boxes supplied to fish merchants and processors in Scotland and the North of England.

Three positions where an Alfa-Laval decanter can give you more and better fish meal



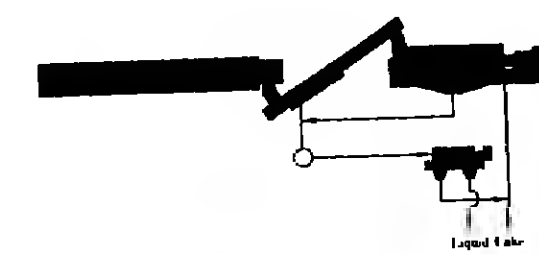
1. After the press

Hundreds of fish processors are using Alfa-Laval decanters to recover fines from press liquid. The fines do not have to be recycled but can go straight on to the dryer with the shredded press cake. At the same time the decanter delivers a clear liquid phase that is readily separated into pure oil and stickwater in Alfa-Laval high-speed centrifugals.



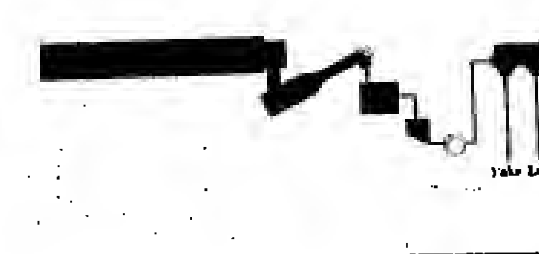
2. Alongside the press

You can eliminate consistency problems and boost the capacity of your press line by putting a coarse strainer in the feed conveyor and routing the strained-off fraction to a decanter connected in parallel. The press gets a coarser, firmer feed to work on — which suits it best — while the decanter effectively deals the fine fraction.



3. Instead of the press

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Alfa-Laval decanters are available for press liquid clarification at feed capacities of up to 36 tons/h and for direct fish mass deoiling at up to 12 tons/h. They are sold and serviced by the international Alfa-Laval organisation, represented in 120 countries. Fill in and post the coupon for more information about decanters and other Alfa-Laval fish processing equipment.

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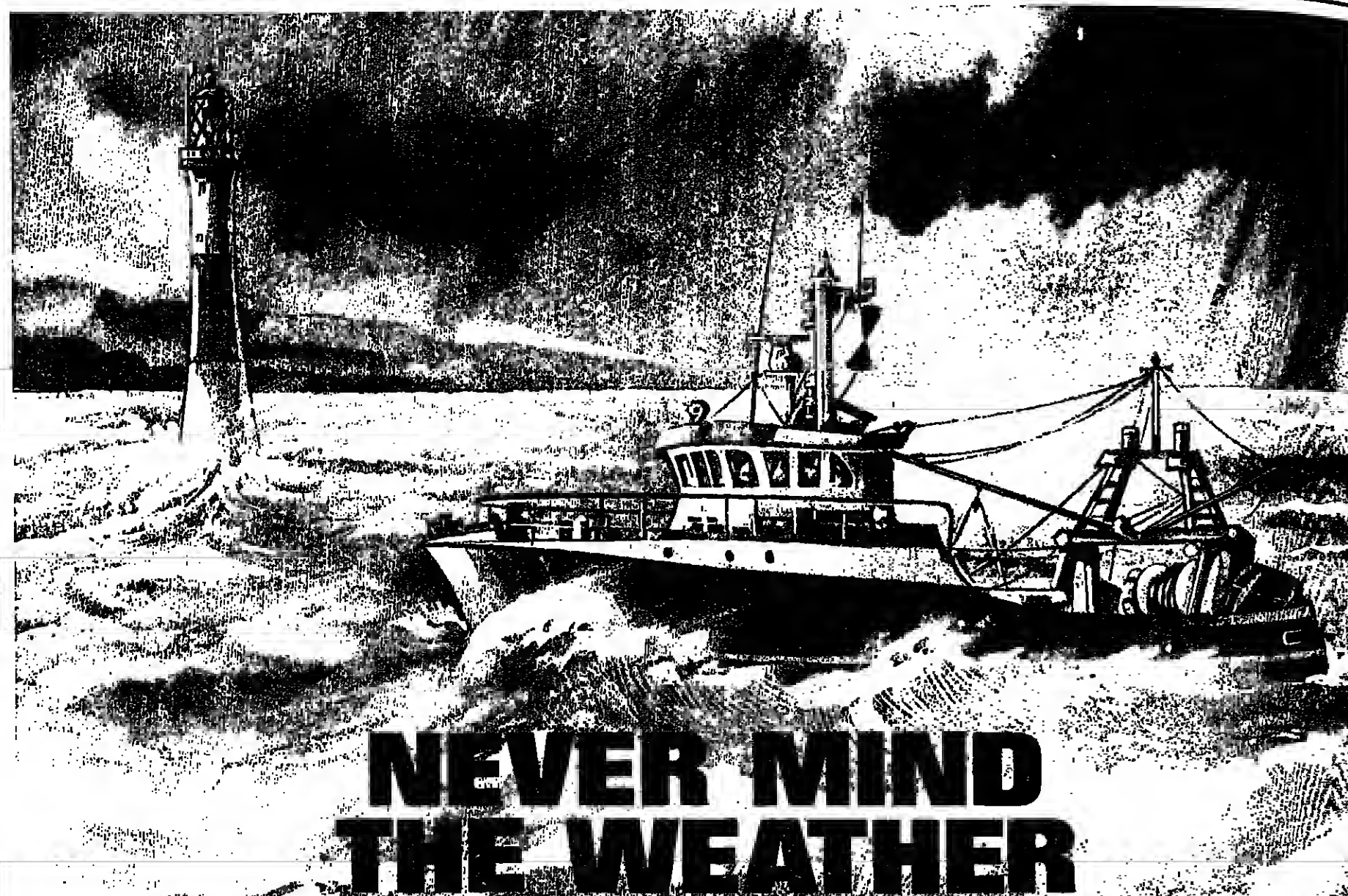
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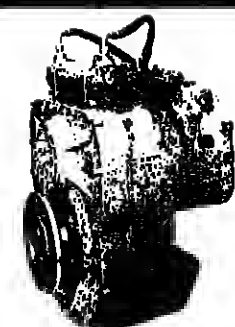
Type 380/225 with theoretical net pull 1.5 and 3 tons.

Type 604/300 with theoretical net pull 4 and 8.5 tons.

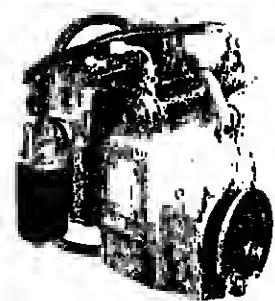
Type 603/380 with theoretical net pull 15 tons.



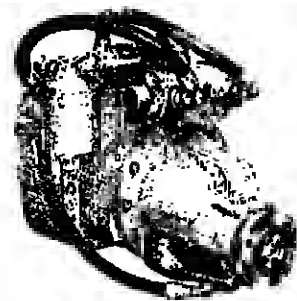
NEVER MIND THE WEATHER



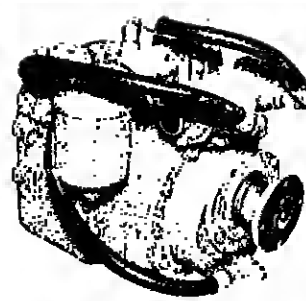
MRF 700 HD Mk IV



MRF 350 HD Mk III



MR/MRF 350 Mk III

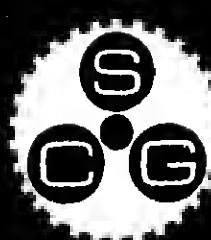


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PORTS & MARKETS

HARBOUR LOAN SOUGHT

THE government of Andhra Pradesh is negotiating a loan from the World Bank for the development of three fishing harbours in the state. The loan is required for the second phase of construction at Visakhapatnam, to start work at Nizampatnam and to complete the third stage at Kakinada.

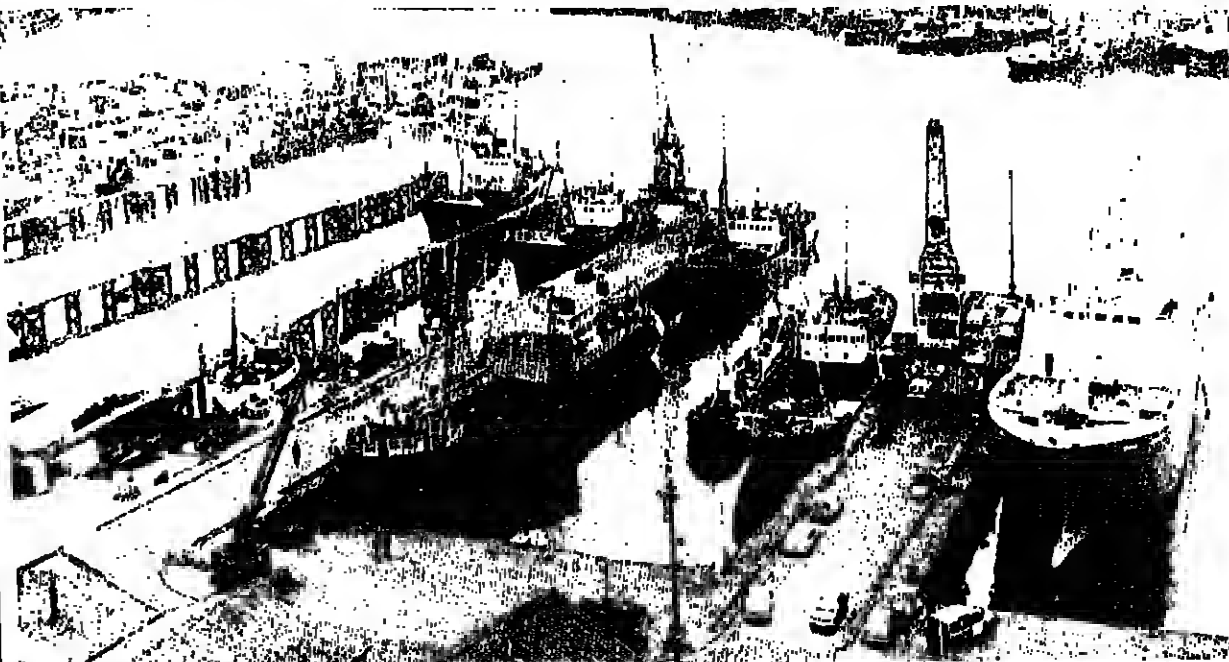
A further harbour has been approved by the central government at Bhavanipatnam. It will cost about Rs15 million and will provide anchorage for 200 boats.

The harbour at Nizampatnam is scheduled to be completed in three years. It will then take 60 mechanised and 600 sailing boats. Kakinada will take 20 trawlers and 150 mechanised boats when the third phase is completed.

Visit to Italy

IN OCTOBER, UK fish and shell fish merchants will be visiting Italy.

The six-day trade mission, organised by the UK White Fish Authority, will start in Milan where its members will be met by the Italian Importers Association. Milan will be the mission's base for three days.



Trawlers at Grimsby in Britain. Distant water ships have been hardest hit by limits and declining stocks.

Hull or Grimsby?

UK ports battle for survival

A CLEAR warning that Grimsby and Hull cannot both survive as major British fishing ports was given last month by the managing director of the big Findus frozen food company.

Speaking at the official opening of the new £1.25 million prepared fish factory at Humberside Road, Grimsby, Mick Colburn said trawler owners were going to have to make up their minds which side of the Humber they would operate. And he

believed Grimsby would be the eventual choice.

His main reason for this confidence was his conviction that the British industry's best chance of survival lay in the development of the near-water fleet.

In his view Grimsby had several advantages over Hull to meet this change.

"At present, the Hull fish market could not cope with that sort of expansion, whereas Grimsby could," said Mr. Colburn. "I also believe that, without too much

difficulty, Grimsby could provide as good facilities for distant water fishing."

The massive investment by frozen food producers in Grimsby and the superior cold storage were important factors.

But he stressed that where fish were landed would not affect his company's operations in Hull. "Hull is already the spearhead of our development work with under-utilised species."

He explained that the new

Salt in the wounds

THE CANADIAN Saltfish Corporation has been criticised by Newfoundland and federal fisheries officials for lack of initiative. An agency of the federal government, the Corporation has developed world-wide markets for Canadian salt cod.

But Newfoundland's Minister of Fisheries, Walter Carter, says major surgery is needed on the Corporation. The federal government should provide it with more aid and loosen its grip on the marketing of Atlantic saltfish.

Gordon Slade, who heads Newfoundland's Department of Fisheries, sees the Corporation as a failure.

Supporting these accusations, Len Cowley of the federal Fisheries and Marine Service in Newfoundland, said: "There is a need for more incentive to put salt into cod."

Saltfish Corporation president, Aidan Maloney, was "astounded by what has been said."

"They must know," he added, "that while officials in Ottawa and Newfoundland wrote off the cod industry ten years ago, this Corporation has been able not only to keep it alive but to expand it without having to call on the public purse."

EXPORT DEAL

AGREEMENT has been reached by Norwegian producers with the Nigerian state import agency over the supply of 3,375 metric tons of stockfish. The price is around 23,000 kroner (about £2,200) a ton.

Ending long negotiations, the agreement is disappointing for the Norwegian industry. But, if private importers in Nigeria are granted licences by the government, there could be an increase in sales.

Last year, private importers were allowed the equivalent of imports by the state company.



The French trawler "Capitaine Byron" — more lucrative to land away from home.

Bigger earnings away from home

AT A TIME when French trawlers were landing an increasing amount of fish at British ports, buyers in their own areas were complaining about a drop in supplies.

In early May the wet fish firm trawler Capitaine Byron came into Hull with 107 tons of blue ling on a landing of 122 tons which earned her £42,842 on the local market. The blue ling sold for £18.65 to £23.25 a 140 lb. kit.

In Fleetwood, the Mont Cenis made her second landing at the port with a mixed catch of 112 tons which sold for £25,880. She was one of three French trawlers landing at Fleetwood in two days.

Later last month, the George Cadoual came into Fleetwood with a fine haul of 150 tons. This included nearly 92 tons of blue ling and sold for £45,914. The other French trawlers landed in the same week,

earning £24,943 and £20,700.

But the French ports are finding that fresh fish is decreasing in their landings. In one week in April three ships landed 3,000 tons of fish in Boulogne — all of it frozen. In Brittany the local FROM held a meeting where it was revealed that trawlers from the area had delivered eight times to British and German ports.

Much more

The reason for the diversions is clear. The trawlers can earn much more for their catches in the fish-starved ports markets of Britain and Germany. It was reported, for example, that one landing of haddock in Britain fetched three times what it would have earned in France.

Although the FROM indicated that owners would in future have to get authorisation to land elsewhere, this is certain to be strongly resisted.

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WHERE OLD HABITS DIE SLOWLY

THE ORISSA village of Bandaravanieta is typical of thousands of Indian fishing communities. It was studied recently by an FAO sociologist on the staff of the FAO/UNDP project for Development of Small-scale Fisheries in South-west Asia.

In Bandaravanieta, he reported, most houses are built with mud walls and palm leaf roofs. Water is scarce and of poor quality and the wells are mostly located a long way from the village.

The average earnings of the workers is about 300 rupees (about £17) a month, of which they spend some 80 per cent. on food. Their situation is better during the four-month prawn fishing season when they earn more. They spend the extra money to pay off as much as they can of their continuing debts, buy storable foodstuffs and, as an investment, buy jewellery for the women of their families.

The village women contribute to income by

LAST month in this series on the lesser-known fishing countries and remote fishing areas, our FAO correspondent CEDRIC DAY presented Versova village, near Bombay, as an example of how a community can be developed by the activities of its people organised in a co-operative. But Versova is exceptional among fishing communities. To balance the picture, he looks at the village of Bandaravanieta, in Orissa state.

selling fresh "trash" fish in nearby markets, any surplus catch being dried. Fish traders handle the fish for the more distant markets and specialised dealers handle prawn sales in processors.

Amenities in the village are few: A dispensary which is constantly short of supplies, schools (including a high school) and a feeder road to the outside world (which has been under construction for three years so far).

Help from development services is restricted, partly because of lack of financial and technical support; visits by welfare officers tend to be limited to the times

when State government officials are due to appear. Health and hygiene standards are low and there is much unemployment among high school graduates who do not wish to take up the main local occupation, fishing, because of its low status socially.

As there are more vessels available than gear for them, the owners of nets, etc., get an extra share of the catch. Yet, typical of the traditionally minded elders of the village, there was strong opposition to the introduction of nylon nets. Their view was that such nets would arouse the anger of the sea!

Conservative

The FAO sociologist found that the villagers generally are conservative in outlook and identify themselves closely with the community's social and religious rites and festivals. Thus, although the government set up years ago a modern panchayat (a village governing committee with an elected membership), the philosophy of caste-headman and elders continues to operate. The government has also promoted the establishment of a fishermen's co-operative but it has not been successful because, among other reasons, the fishermen are reluctant to repay loans.

As in other fishing communities in the country, there is friction between the village fishermen and those operating shrimp trawlers because the latter intrude into the village men's inshore fishing grounds. This is a source of disagreement whenever the

two groups confront each other along the coast of India. There are often violent clashes, sometimes erupting into fighting, and much damage is done to boats and gear.

This careful investigation by the FAO sociologist provides a sobering picture of the realities and problems of small-scale fisheries development at the village level in India. The requirement for progress is not only a whole package of development effort, embracing improvements in craft, gear, fishing techniques, landing facilities, handling, processing, distribution and marketing, but the longer term effort in education and changing age-old attitudes, beliefs and customs. The whole problem is largely sociological.

Middle man

In my recent tour of many fishing communities in India, it was obvious that traditional habits and ways of life and thought retarded the community development programmes so hopefully launched. For example, even where prosperity has come from the development of the shrimp fishery, old habits die slowly. Those fishermen who have profited, often through government and other assistance, are quick to move into the position of the traditional "middle man." Thus, boats, gear, equipment, etc., provided with the objective of modernising the "middle man" system are used to reinforce it.

Veteran

I ran into another example far away from Orissa, on the west coast of India, in the state of Kerala. There I talked to a 70-year-old Varachan Varghese, a grizzled and wiry veteran of the seas.

He told me that those men fortunate enough to acquire improved gear and boats soon exploit their good fortune by employing fellow fishermen at



A veteran fisherman at a village in Kerala.

'We need better boats and nylon nets'

low rates. "We other fishermen would also like to be assisted," Varghese said, "so that we can have better craft and be trained in the use of seines and fish for ourselves." He told me that they would like, for a start, to be able to get nylon thread to be able to make more effective nets and to have racks for the more hygienic drying of fish.

The need for the racks was evident on the beach of the village where fish was strewn to dry. Not only is the beach polluted by the villagers, birds and dogs wander through the drying fish, and sand and dust are blown over them.

The FAO study of the Orissa fishing village, along with other studies of a similar nature carried out in recent years, and the situation I saw in Kerala and in many other places in other states, underlines the fact that development cannot be achieved simply by provision of equipment and other material supplies.

A whole way of life has to be changed if the fishing communities of India are to become integrated with the fisheries development of the country. The development of the shrimp industry in Kerala and other states shows the way this can be done.



Repairing nets alongside one of the more modern GRP-hull boats now working from many Indian beaches.

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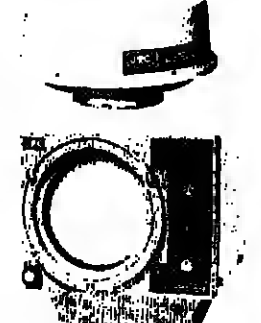
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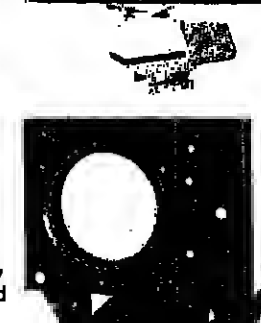
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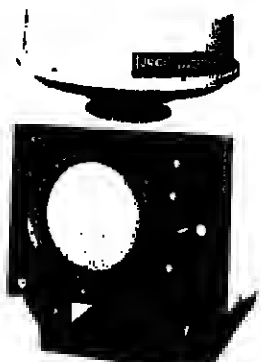
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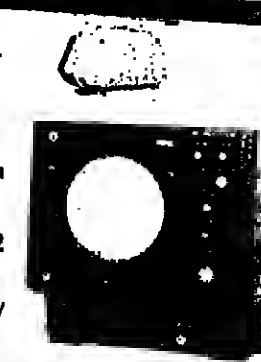
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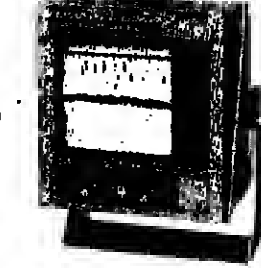
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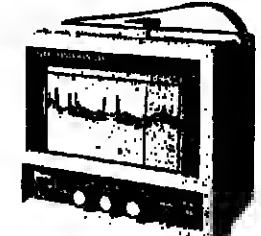
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A-type (0-210m), B-type (0-420m) and C-type (0-840m) available.
200kHz or 80kHz transducer unit.
100W power output.
OC12-32V operation.



JRC ZOOM FISH FINDER

NJA-156

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A-type (0-380m) and B-type (0-760m) available.
50kHz transducer unit.
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OC12-35V operation.



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At the fish market in a south Indian village.

FAO working papers on small-scale fisheries

In Part Three of his review of an FAO/UNDP working paper on small-scale fisheries in India, CEDRIC DAY outlines Indian government policy and development plans for fisheries. Parts One and Two appeared in *FNI* in April and May. He also reviews the working paper on small-scale fisheries in Sri Lanka...

THE FAO/UNDP working paper on Sri Lanka throws a revealing light on the quandary of a government trying to slow the drain on foreign exchange spent on importing fish while striving to maintain consumption with domestic catches.

As the paper points out, the Sri Lanka government gives high priority to fisheries development. It supplies the industry with subsidies, grants and favourable loans; and it provides opportunities for fisheries to get assistance from abroad.

But these efforts have so far proved disappointing. The cut-down in fish imports since 1972 has led to a drop in per capita consumption from 14.5 kg in that year to 10.7 kg in 1976, while prices have increased to levels beyond the reach of many people. This presents a serious nutritional problem because fish forms an important part of the people's diet — about 70 per cent of the animal protein intake.

The working paper prepared by FAO's

SUPPLY PROBLEMS IN SRI LANKA

project team as a result of a survey carried out in August and September 1976 makes an attempt to analyse the situation and suggest remedial action.

Before reporting on the views expressed in the paper, I must stress that it is not an official document of FAO or of the government, even though the survey was carried out in co-operation with the Ministry of Fisheries of the Sri Lanka government.

The paper presents an excellent practical document for anyone in the fishing industry, domestic or foreign, interested in the development of the fisheries of Sri Lanka. It contains relevant data on the country, a brief history of Sri Lanka fisheries, a report on fisheries

administration and on the various institutions, a brief survey of resources, production, fishing craft and gear, fish landing centres, handling and processing facilities, marketing and distribution (both of import and export trade), and ancillary industries. The paper also looks into the socio-economic aspects and the government's fisheries policies and plans for development of the resources.

While many statistics are given in the paper, I must stress that these are mostly based on estimates and should be regarded as indicative, not factual.

The FAO project officers have followed up their general paper with an "assessment of problems and needs in marine small-scale fisheries" in Sri Lanka. They have examined the situation under five headings: fishing gear; engine spares, maintenance and repair; fishery co-operative societies; physical planning; and institutional support. In each case, they have listed the actions needed to be taken to meet development demands.

While the paper is succinct in each of these five chapters, it is too lengthy to deal with in full in this report. I have therefore compressed both the final paragraphs of each chapter on "implications" that is, the conclusions reached by the findings of the survey in each sector dealt with action needed, as a consequence in each case.

Nets needed

There is an acute shortage of nets, the Sri Lanka fishermen as a whole operating with about half the number needed. Many of those in use are of poor quality and are expensive, to some extent due to the purchase and distribution system. The resulting loss in production and cost of importing fish could be more than offset by a more liberal nets import and distribution system.

As it will be upwards of ten years before the government's plan for making Sri Lanka self-sufficient in fishing gear production achieves its objective, the immediate need is to import about US\$3 million worth of nets, to be distributed and sold through authorised establishments to bona fide fishermen, short-term credit being provided to fishermen through local banks.

At the same time, production of nets at village level should be promoted by increased import of twine.

Records at co-operatives

show most time lost by fishermen is due to lack of engine care and spares and the high price of the latter. The net loss of revenue of fishermen from these causes is estimated to be about US\$3 million a year.

As there is an accumulated deficit in the import of spares, the immediate need is to import more than twice the yearly requirement of US\$1.5 million. The long-term need is to set up a network of fully-manned workshops in fishing centres, train fishing crews in maintenance of engines, and promote local manufacture of spares. Loans through banks should be made available for establishing workshops.

Co-operatives

The level of efficiency of fishery co-operatives is low. They absorb about \$1.5 million of the \$1.5m. subsidy provided by the government yearly for Sri Lanka's fleet of 32,000 boats. Repayment of loans to co-operatives is about 80 per cent in arrears.

About 45 per cent of the fish landed by co-operatives is subsidised compared to three per cent in the private sector. Loss in catches of co-operative vessels is estimated at 111 tons a year because of poor management and operational practices, 75 tons due to shortage of gear and about 7 tons a year because of engine failure.

The FAO working paper assessment suggests that the main functions of the primary co-operatives should be restricted to fish marketing and supply of services.

They should not be concerned with production, which should be the responsibility of the fishermen. Credit facilities should be supplied through banks, not the Fisheries Department.

Societies

The primary societies should be upgraded and given more autonomy to enable them to develop into sound co-operatives, with fishermen having more influence in running them and the extension workers being better trained and equipped in all aspects of operation of co-operatives.

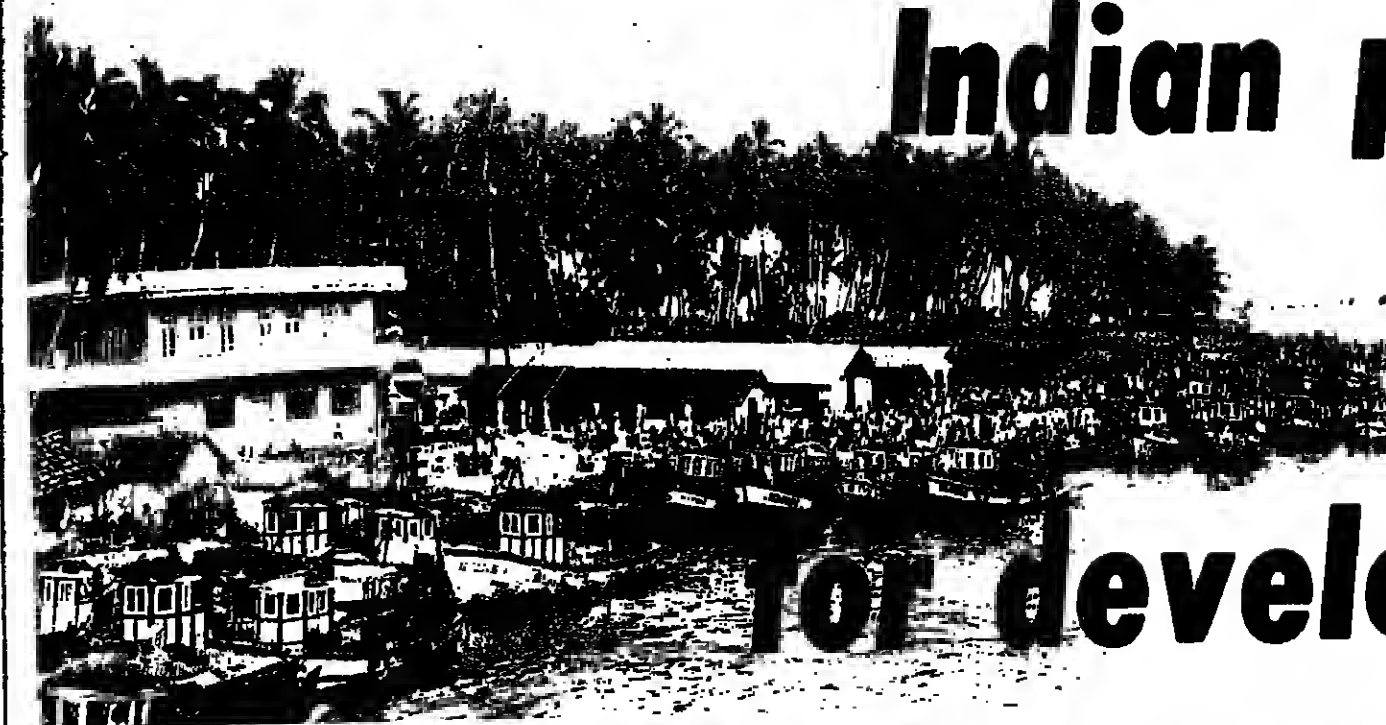
turn to page 69



Hulls are fitted out after moulding in a GRP boatyard in Sri Lanka.

Part three

Indian policies and plans for development



Boats alongside the jetty at a fishing harbour in south India. Harbour development has a high place in government plans to increase fish production...

AS THE FAO/UNDP working paper on marine small-scale fisheries in India points out, the government's aims in fisheries development are to increase the supply of fish (because it is a protein-rich food), improve the socio-economic conditions of the fishermen and their communities, and increase the export of fish and fish products to earn foreign exchange.

The all-important requirement for achieving these objectives is the development of the small-scale sector through "improvement of design, material and operational aspects of fishing units, fish handling, distribution and marketing and economic betterment of the fishermen community."

The report continues: "The coastal mechanised fishery is to be further developed by introducing additional mechanised boats, by increasing their operational efficiency and reducing operational costs."

It refers to the plans for building up the deep sea fishing fleet by "either imported or indigenous constructed" vessels, and the building of harbours, processing plants, cold storages and so on. Marine fisheries research, extension and training are to be increased and joint ventures encouraged in fisheries between Indian and foreign industrial concerns.

Successive plans

This general approach to fisheries development has, of course, been evolved through the successive five-year plans. As the FAO report states, such development plans can be classified as: (i) central sector schemes; (ii) centrally sponsored schemes; and (iii) state sector schemes.

The first group consists of activities which are the direct responsibility of the government in New Delhi or those in which it has direct promotional interest. The second consists of schemes sanctioned by the central government to assist states in key areas. The schemes are administered by the state governments. The third group consists of schemes drawn up, financed and administered by the state governments. The report gives a list of schemes in all three categories.

Important schemes in the states sector for marine fisheries include assistance to non-mechanised traditional fishing, small boat mechanisation, deep sea fishing, pilot projects, research, fish processing, storage and marketing, training, education and extension

services, and better housing and community facilities for fishermen and their families.

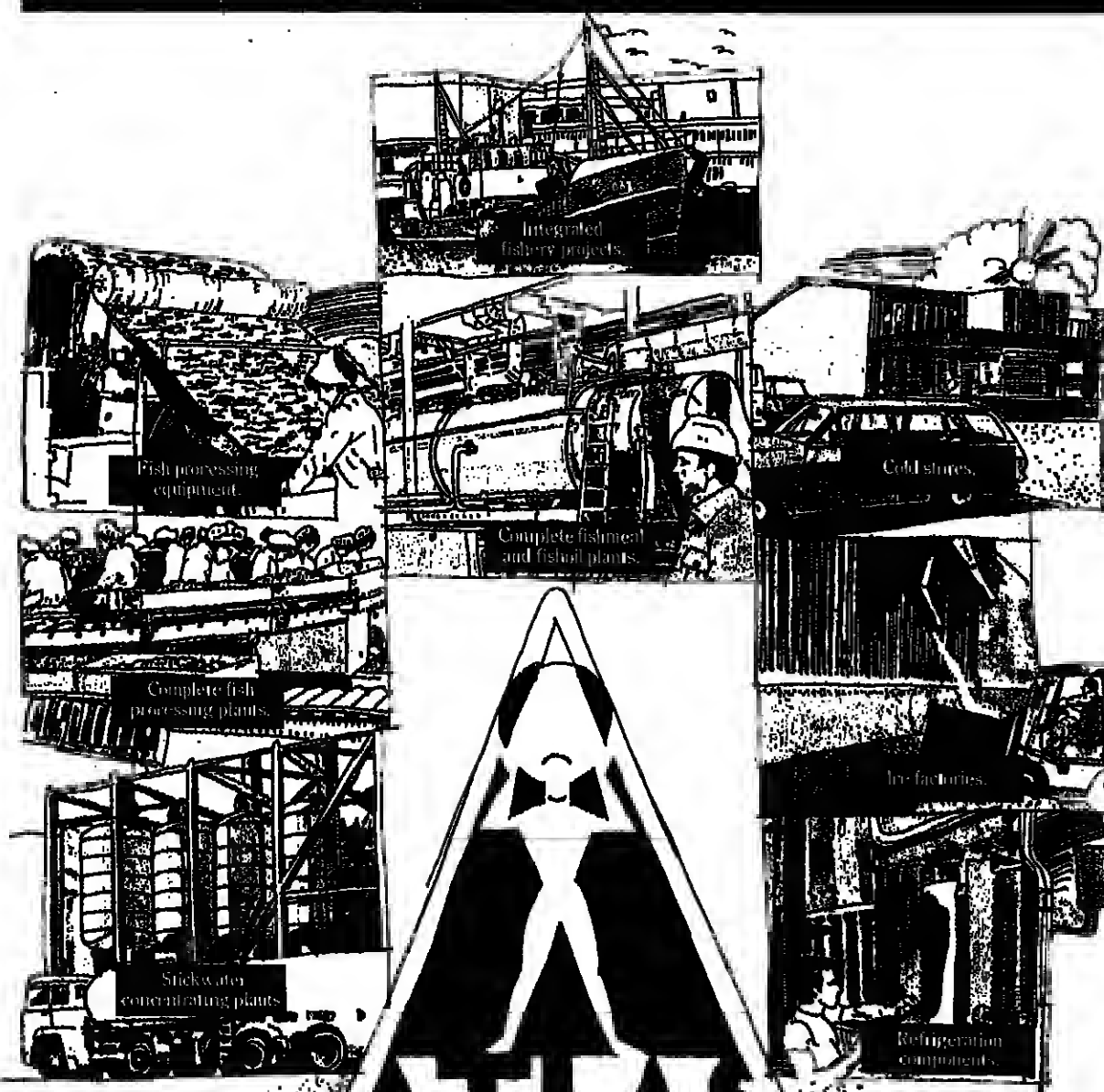
As I said in the introductory article about this FAO working paper, it is a practical and compact guide to the small-scale fishing industry in the sub-continent, a most informative document for anybody in the fishing industry who is interested in, or concerned with, Indian fisheries.

Working papers

But, of course, India is a sub-continent and the states that make up that country are, in size and population, countries themselves, from a European point of view. The FAO project staff have, as part of their close investigation of the Indian fishing scene, prepared "working papers" on the main maritime states.

I shall, therefore, deal with each of these in subsequent issues, starting with the report on West Bengal in July.

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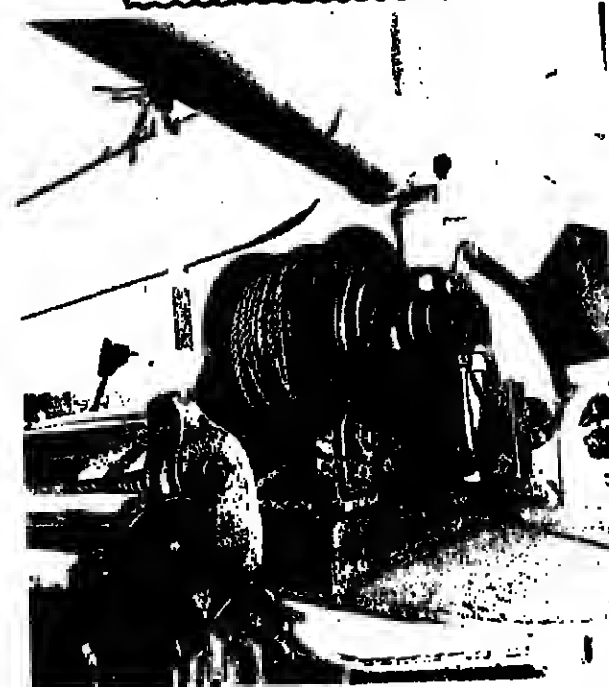
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WATCH THE NAME

THE RAYTHEON Company has pointed out that Fathometer is its registered trademark for depth sounders.

To prevent the mark from becoming a generic word like aspirin, cellophane and thermos, all of which were once trademarks, Raytheon says it should only be used to describe electronic depth sounders made by the company.

The trademark Fathometer dates back to 1924 when the Submarine Signal Company, now a part of Raytheon, introduced the first electronic depth sounder and installed it in the US Coast and Geodetic Survey ship *Lydian*.

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ANOTHER CHAIN

A FURTHER extension of the Decca Navigator System has been announced by the Japanese Maritime Safety Agency.

The stations of the new chain will be situated on the plain of Kanto in central Honshu and their transmissions will provide radio navigational coverage for vessels using the approaches to Tokyo and Yokohama.

Layout of the new chain has been arranged so that its coverage will link with

that of the Tohoku chain and enable vessels from the north-east to use the system without break from north of Hokkaido down to the ports of central Honshu.

Vessels from the south will have the benefit of Decca coverage at Tokyo and Yokohama as well as at Kobe and Osaka.

Engineering work has already started on the new station sites and the service is expected to become operational in the spring of 1979.

Paint programme to protect Hull ships

J. MARR and Son Ltd., of Hull, England, are co-operating with Jutan Henry Clark on a two-year planned maintenance programme for both corrosion control and paint application.

Eight stern trawlers are involved. Although these will vary in size, the work has been allocated in ten separate sections, each roughly the same size, to allow the work to go on regardless of weather.

It is well known that with many types of vessel routine painting tends to look good for the moment but confers very little real benefit as it conceals corrosion. A stern trawler is an expensive vessel and unlike some larger ships cannot tolerate much thickness loss in the plates.

Corrosion of the lighter scantlings could involve plate renewals which would prove very costly owing to the disturbance connected with internal fittings, etc.

The new work scheme is

intended to bring back, over a period of time, the original standard, thus extending the working life of the vessel and reducing the likelihood of extensive lay-ups for corrosion control. Also, it will be possible for the owners to cut maintenance in advance.

The appointed contractors will be able to cope with all painting requirements, wash with detergent and clean up previous paint work. By regular cleaning and removal of corrosive agents, paint life will be extended and metal maintenance costs reduced.

Pressure

According to Mr. A. McKelvie of the Palm Research Association, there is considerable pressure for adoption of international standards of steel cleaning before painting.

Mr. McKelvie was one of those who prepared independent reports on a new system of blasting developed by A. E. Engineering of Bradford, which is now achieving considerable success both in Britain and abroad.

The new system uses low pressure water with entrained abrasive, plus an inhibitor, but has the advantage that it is fully mobile. One of the interesting features of this system is the fact that an operator can, by simply varying the pressure, take off a top coat only or by using full power blast back to white metal.

Can be held

By using the automatic feed of the inhibitor the white metal finish can be held for 24 hours or more.

Mr. D. Trotman of BSRA said that an investigation is now under way to determine the effect on various primers of differing cathodic protection potentials. Only when this is completed will proper understanding of reactions between paints and cathodic protection be achieved.

MEASURING FROM A DISTANCE

THE University of Miami's Rosenstiel School of Marine and Atmospheric Science has made it possible for land-based observers to monitor the corrosive effects of seawater on a metal alloy being tested on a 100-ton NOAA data buoy moored far out in the Gulf of Mexico.

Remots

Its new instrument is a microprocessor controlled remote corrosion rate monitor. This can measure the potential of a coupon of test material immersed in seawater against a reference electrode. It then shifts the potential by a few millivolts and measures the current it takes to change it.

The values, transmitted from the field instrument and typed out on a computer at the NOAA data buoy office at Bay St. Louis, Mississippi, can be read to determine the rate at which the surface of the test metal is corroding, and the type of corrosion process at work.

Diesel brochure

A NEW 12-page brochure by Cummins Engine Co., describes the Cummins K series of marine diesel engines for fishing and other work boats.

This full-colour brochure lists specifications of both the six cylinder in-line configuration, with 265 and 470 continuous horsepower ratings, and the 12 cylinder V configuration, with 700 and 940 hp.

Comparisons

It contains tables which compare features of the K series engines, including fuel consumption in gallons (litres) an hour, with those of other makes of marine diesels in the same horsepower group.

A free copy of the brochure "Cummins K Marine Diesels Around the World" can be obtained from Literature Control Service, PO Box 99085, Jeffersonville, KY 40299, USA.

K marine diesels around the world

DEX ADDS AN ENGINE

DEX MARINE & Industrial Engines Ltd., of Scunthorpe, England, has introduced a turbocharged diesel to its range.

The new Dex 6/150 is a six-cylinder vertical four-stroke direct injection unit based on the Ford 2704ET and develops 150 bhp. The turbocharger, gives maximum boost pressure of 18 lbs/sq in (1.25 kg/sq cm).

Engine cooling is by a positive displacement pump which draws water to the patented Dexflow Manobloc oil cooler, then through the Dex two flow heat exchanger to the gearbox oil heat exchanger and finally to the stainless steel water jacketed exhaust bend.

In the engine, water is circulated through the cylinder head, block and exhaust manifold by a belt-driven centrifugal pump. Temperature is controlled by a Dex twin wax element bypass thermostat which channels the water flow back into the Dex header tank until the correct operating temperature is reached. After that the flow is diverted to the two-flow heat exchanger and cooled before re-entering the system. This system is said to ensure a constant, uninterrupted flow of coolant whenever the engine is running.

The Dex range now comprises two normally aspirated units, the 4/80 and the 6/120, and now the turbocharged 6/150. A further turbocharged unit, of still greater power, will be announced soon.

Full details of all Dex engines and components are available from Dex Marine & Industrial Engines Ltd., Grange Lane North, Scunthorpe, South Humberside, DN16 1DT, England.

NEW CHIEF

GUY STORME (55) has been appointed managing director of the Anglo Belgian Company of Genl. Announcing the appointment, Roger Drory, ABC's chairman, said: "I am delighted to welcome Guy Storme to this position since, as a successful industrialist, he will bring a valuable breadth of experience to the company at a most important phase of our development."



"The company has recently announced a new design of engine, the DZ, which we see as having an excellent future. One example is for propulsion of the larger (tuna) fishing boats for which there is an increasing market in Africa and Europe, especially in France and Spain. Interest in the new engine already has been most gratifying."

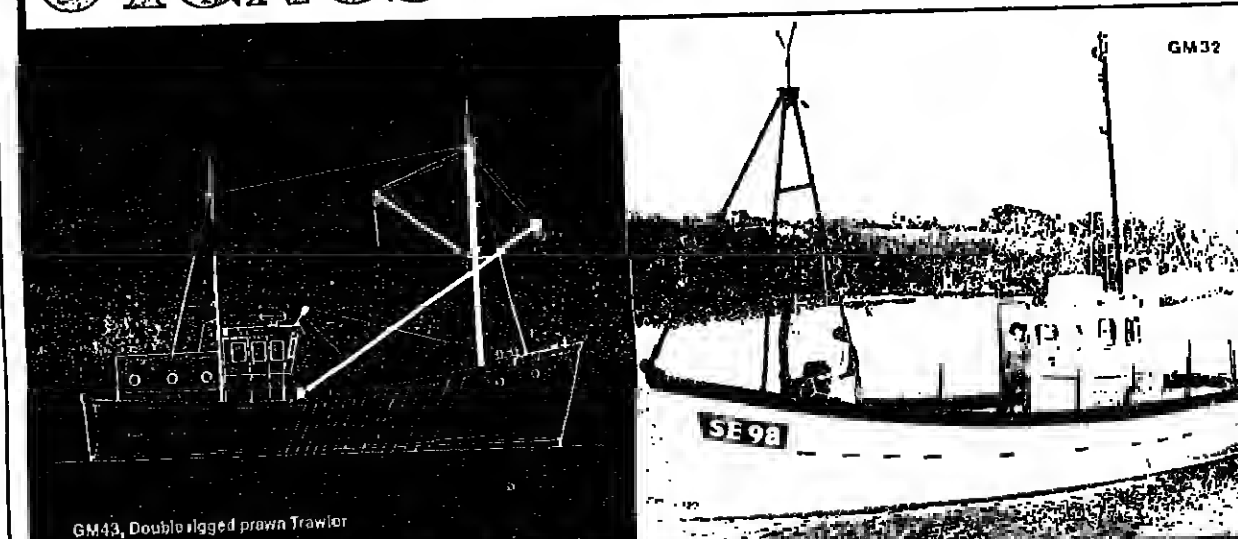
Pocket warmers

TWO NEW electronic pocket instruments for measuring temperature, rotary motion and pH have been announced by Kane-May Ltd. The two instruments are called Accuterm, a small electronic unit, and Accu-pH, an infra-red, non-contact thermometer.

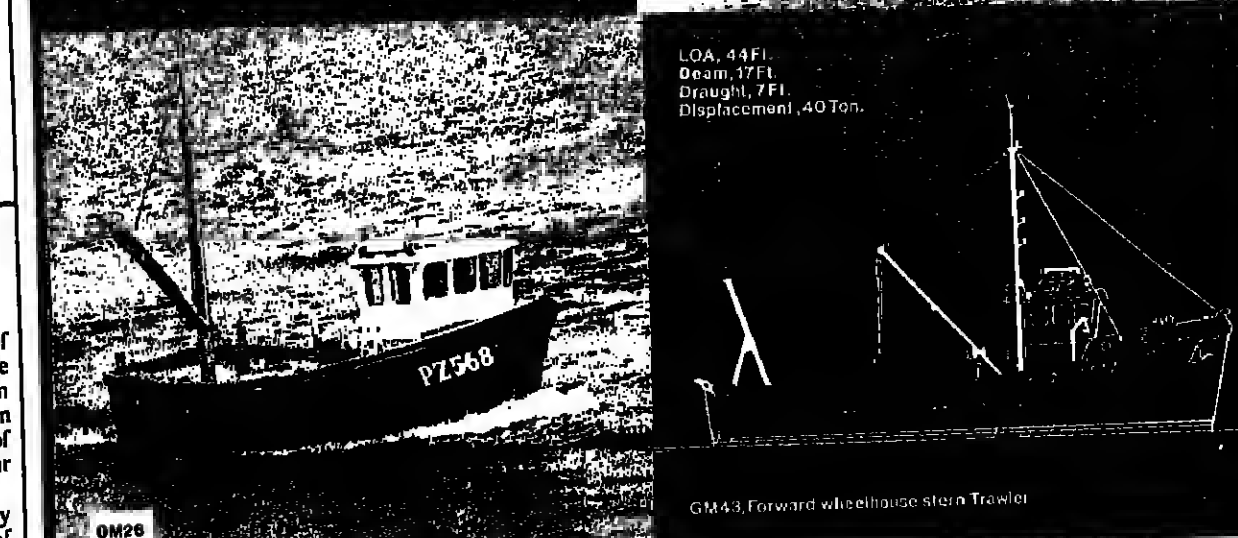
Accuracy, which is available in two versions to cover 0 to 1000 deg. C and 0 to 2000 deg. C, shows measurements on a 12.5 mm liquid crystal display. It can operate from its own self-contained standard battery or from an external supply in a permanent or semi-permanent mode and it provides facilities for the operation of remote graphic recorders.

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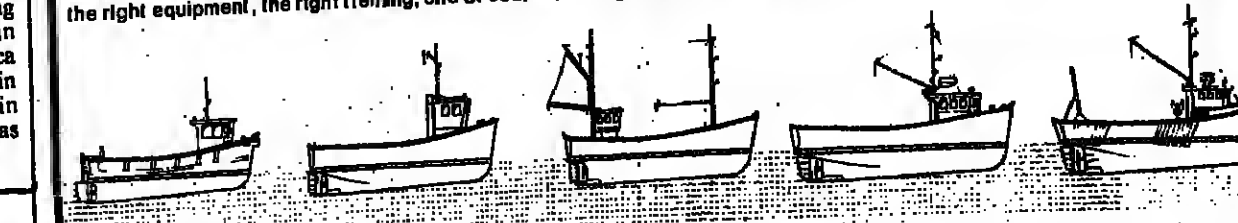
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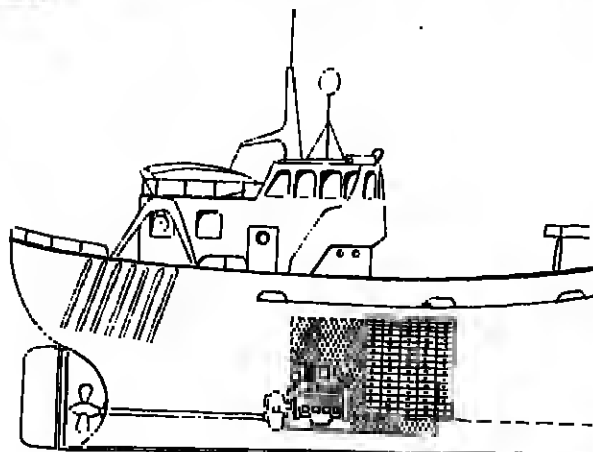
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EEL STUDY NOW IN ENGLISH

DR. F-W TESCH'S massive study of the biology and management of anguillid eels is now available in an English translation.* First published in 1973 under the title *Der Aal*, the book has been updated during translation by Dr. I. W. Henderson of the University of Sheffield.

It is a detailed and fascinating account of research into eels of the genus *Anguilla* in the Atlantic and also in the Indo-Pacific region.

In the translation, the bibliography has been brought up to date and now contains about 1,100 references.

The book's 434 pages are well illustrated with photographs, drawings, diagrams and tables.

*Published by Chapman and Hall, London. Price £18.

Fish dictionary's second edition

THE OECD's Multilingual Dictionary of Fish and Fish Products, out of print for some time, has been published in a second edition. This book has become an essential information source about fish products around the world.

It gives names in 16 languages and briefly outlines uses in two — English and French.

A panel of experts engaged in fish research and development work advised the OECD for this new and revised book. The result is an up-to-date working tool that no fish trader or processor can afford not to have on the shelves of his library.

Refrigeration journal

IPC Science and Technology Press, in collaboration with the International Institute of Refrigeration, are publishing a new bi-monthly journal covering the theory and practice of refrigeration and related subjects. The *International Journal of Refrigeration* embraces all aspects of research, development and applications in scientific, industrial, commercial and domestic fields.

The subscription rate is £25 a year (six copies). Further details from IPC Science and Technology Press, 32 High Street, Guildford, Surrey, England.



FISH FARM ENGINEERING AND ECONOMICS

Fish hooks
from
bone
to steel

CRITICS of the fish farming industry who allege that more is written about it than is carried out successfully will feel their argument is supported by the recent flood of books on several different aspects of aquaculture.

But for the growing number of people who see in fish farming the logical way of supplementing limited supplies from hunting, the books offer information they are seeking and an encouragement to look to ponds, cages and hatcheries and not only to boats, fish finders and nets.

Among the most impressive of these new volumes is *Aquacultural Engineering* by Frederick W. Wheaton.

University

The author is in the Department of Agricultural Engineering in the University of Maryland. In this work of 700 pages, he brings together state-of-the-art information "now scattered through 50 to 100 different journals."

He summarises data on physical, biological and general design aspects of fish farms. More than an original study of the complexities of engineering in this field, it is a useful handbook "that will save hundreds of hours of literature searching."

Potentially one of the most valuable sections of intensive aquaculture is the raising of

shrimps and prawns. This is done in several countries but its practitioners are still striving for the major breakthrough — a closed system to which the crustaceans are farmed through their life cycle.

A valuable assessment of progress is contained in *Shrimp and Prawn Farming in the Western Hemisphere*. Edited by Joe A. Hanson and Harold L. Goodwin, this carries the papers presented and discussed at a workshop on the culture of penaeid shrimp held in Galveston, Texas, in 1975.

Contribution

If prawn farming progresses as fast as the publication of these papers, we shall be hunting the animals for a long time yet. But the book is an interesting contribution to our knowledge of the subject and certainly worth the attention of

anyone interested in enhancing the stocks of these animals.

To a much wider study, Professor E. Evan Brown, of the University of Georgia, considers *World Fish Farming: Cultivation and Economics*. This again is a compilation and acknowledges two contributors. It looks briefly at aquaculture developments in some 30 countries.

The 400-page book is well

illustrated and observations in it are amply supported by tables and diagrams. It is perhaps more for students of fish farming than the actual practitioner, but it is a good introduction for anyone who wants to know where fish are cultured, how much are raised and where we might see developments in the future.

Planning

Even stronger on theory is a little book called *Planning of Aquaculture — an introductory guide*. This was prepared by Dr. T. V. R. Pillay, who heads work on aquaculture in FAO in Rome. It was longer in preparation than the prawn

book, being based on a "think tank" in Norway in 1974. A group of experts from all over the world met on an island for about a week. In isolation, they thought out a strategy for the development of aquaculture.

The book is about 70 pages long and might be some use to people in government or business trying to persuade others that there is a future in fish farming as an investment.

- 1. John Wiley & Sons. Price £25.
- 2. Academic Press Inc. Price \$18.
- 3. AVI Publishing Company.
- 4. Fishing News Books. Price £4.80.

A BOOKLET on the history of fish hooks has been published by the Marine Advisory Service of the University of Delaware.

It follows the development of hooks from the early Stone Age, when men used balled chips of bone or wood, to the present day.

It tells how the American Indians and some Pacific Islanders lacked the techniques and raw materials for metal hooks. They used gorges and hooks of shell and bone.

The Indians used hooks only as a last resort. They preferred traps, band catching and, in some cases, plant juices tossed into ponds to stupefy the fish.

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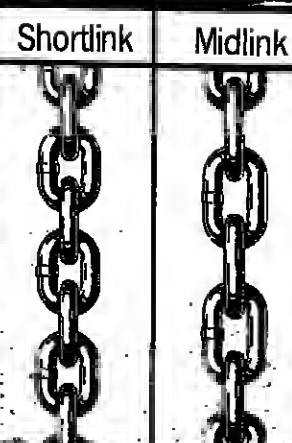
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Focus on Japan squid industry

JAPAN is the world's largest catcher and consumer of squid, with Spain a close second. Both countries have for some time been exploiting squid remote from their own coast area, mainly by trawling.

In most cases these distant resources have not been fished by the neighbouring states, so that a competitive situation has not arisen, but now the rest of the world is looking harder at cephalopods as a means of boosting a shrinking fish resource.

Special study

Because of the rising importance of cephalopods and thus the rising importance of Japan's fishery for them, FAO suggested a special study. The result is FAO Fisheries Technical Paper No. 173, *Stock Assessment of Cephalopod Resources Fished by Japan*.

The booklet includes two world maps showing the distribution of resources and the levels of world catch by areas.

The two major areas, the north-west Pacific, followed by the west-central Atlantic off the African coast, together with the Mediterranean and

part of the north-east Atlantic, are all considered overfished. Indeed, stocks of *Todarodes pacificus*, the main species caught by jigging, are now considered to give cause for alarm. In other areas, the proportion of *Todarodes* in the total catch has been declining.

The booklet proposes that some fishing should be diverted to less popular species, some of which are considered still to be plentiful. Octopus is not widely fished in many areas, for instance, nor is the cuttlefish *Sepietta* and both can be exploited by small boat fisheries.

Among the oceanic squids, the *Onnastrophidae* are thought to have good prospects, while in the eastern tropical Pacific there may be huge stocks of *Dosidicus gigas*.

A great deal will depend on whether some way will be found to present cephalopods in a more acceptable form to people unaccustomed to eating them. If this should happen, then the effect on stocks — and prices — could be considerable.

FAO Fisheries Technical Paper No. 173, from FAO agents or from FAO Publications Division, Via delle Terme di Caracalla, 00100 Rome, Italy.

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Multilingual Dictionary of Fish and Fish Products - OECD

Dictionnaire Multilingue des Poissons et Produits de la Pêche - OCDE

Aalpricken or *zanthe* — these are the first and last entries in the revised edition of this fascinating book which is so much more than a dictionary in the normal sense.

The main text in English and French briefly describes the world's commercially used fish and other marine life, gives local names and usage and indicates the various ways in which items are processed and marketed in different areas. An outline description of the processes is also given.

Apart from identification by scientific name, each of the many hundreds of entries is translated into as many as possible of the 13 other languages: Danish, Dutch, German, Greek, Icelandic, Italian, Japanese, Norwegian, Portuguese, Serbo-Croat, Spanish, Swedish and Turkish. A full index for each language completes and adds value to the book. The ample cross-referencing makes this book both an invaluable tool for international communication and trading, and the source of a remarkable amount of general knowledge. The brief entry opposite shows the typical layout.

Because of its lasting value, the dictionary has been designed to stand constant handling and the brown leather-type material with gold embossing will also add distinction to your shelves.

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Perth to host Expo '79

PERTH in Western Australia will be host city to the Australian Fish Expo '79. The exhibition will be held during the time of the 150th anniversary of the state of Western Australia.

This is the second Australian fisheries exhibition. The first, modestly planned but rated a considerable success, was held in Melbourne in 1976.

The dates of Fish Expo '79 are August 26 to 29 and the venue is within the giant Royal Showgrounds, "a comfortable 15-minute drive from the centre of Perth."

Along with the exhibition, there is to be a seminar on the Australian fishing industry in the 1980s.

Space at the exhibition will be allocated in modules of 10 sq. metres. Applications close on August 31.

Further information about the exhibition and conference can be obtained from the organisers, Australian Fish Expo '79, P.O. Box 519, West Perth 6005, Australia.

SOUTHERN SALMON SYMPOSIUM

THE BEAUTIFUL southern city of Concepcion in Chile is to be the venue of the first International Symposium of Southern Ocean Management. Covering the theme seeding the Southern Ocean with salmon, the symposium is certain to arouse world-wide interest.

It is being held at the University of Concepcion from September 11 to 14 this year. The University is organising it in collaboration with international organisations.

Main aim of the symposium, reports FNI's correspondent in Chile, is to bring together specialists and representatives from interested organisations in different parts of the world. During the four days in Concepcion, they will exchange information and ideas on the feasibility and the desirability of introducing salmon into the Southern Ocean.

Workers in marine research will discuss the areas of R&D necessary for this type of project. They will consider and devise a plan covering immediate action that may be implemented soon with now-available funds.

A tentative agenda divides the symposium into four major subject areas. It will begin on Monday, September 11, with a geographical review of the salmon

Meetings and exhibitions

environment. This will be followed by an overview of salmon culture practices and reports are expected from Japan, Scotland, the United States and New Zealand.

Tuesday's programme will start with a morning session devoted to the history of salmon seeding in the southern Pacific, including Chilean, United States and Japanese experiences.

The afternoon session will deal with oceanography of the South America sub-Antarctic. It will cover physical and chemical aspects of the off-

shore area, the use of satellite imagery for detecting offshore current patterns, and the hydrography and biology of the offshore channels.

Finance

On the Wednesday, the programme will cover management and finance. There will be presentations on the international management of Southern Ocean salmon stocks, the Chilean government structure for salmon management, and prospects for financial support.

On the final day of the symposium, participants will tour present and possible future seeding and hatchery sites. These will include Chiloé, Coyhaique, Puerto Natales and Ultima Esperanza.

Among those listed tentatively as participants and guest speakers are Dr. Timothy Joyner (writer of the recent two-part series on southern salmon seeding in FNI), Dr. Lauren Donaldson (University of Washington), Dr. Colin Nash (Oceanic Institute in Hawaii), Dr. K. Nishimura (Japan National Salmon Hatchery Service), John Thorpe (Freshwater Fisheries Laboratory, Scotland), Dr. Duncan Waugh and J. R. Galloway (Marine Department in Wellington, New Zealand), and A. Nagasawa (International Co-operation Agency).

Further information about the symposium can be obtained from the co-ordinator, Dr. Victor A. Gallardo, Department of Marine Biology, University of Concepcion, Casilla 1367, Concepcion, Chile.

Fish in the new era

LEADING figures in the British fishing industry and in the world fish trade will be taking part in a workshop on one of the days of the First International Frozen Food Industries Conference and Exhibition in London later this month.

The exhibition opens for five days on June 25 at Olympia and will be presenting at least 100 stands which will show exhibits from ten countries.

At the same time as the exhibition, there is a three-day conference on June 26, 27 and 28 — at the Royal Lancaster Hotel. This will cover most aspects of frozen food production and marketing and will be addressed by speakers from 16 countries. The attendance over the three days is expected to run into three figures.

Visitors

According to the organisers, Food Focus Ltd., thousands of exhibition tickets have been distributed to overseas visitors coming from Europe and North America.

Mick Coburn, managing director of Findus, one of the top frozen food companies in Britain, will chair the fishery workshop which will be titled "Is there a limit?"

The effects on British fisheries of EEC membership and the virtual halting of distant water fishing will, say the organisers, be among the key topics to be considered in the workshop. Speaking on the British industry's adaptation to the new regime will be Charles Meek, chairman of the White Fish Authority.

Murray Berger, president and chief executive of the US company Seabrook International will deal with the impact of re-allocated limits on world fish supplies for frozen food industries. Talking on Newfoundland's new status as

Meek: Britain's adaptation to a new regime.

a fish producer will be the province's Minister of Fisheries, Walter Carter.

Included as a frozen food supplier will be the subject of a talk to be given by Olafur Gudmundsson, a director of the Icelandic Freezing Plants Corporation and manager of its operation in the United Kingdom.

Trends

World-wide consumption and marketing trends will be reviewed by Robert Erkins, publisher of the International Erkins Seafood Letter. The search for new sources and species caused by pressure on supplies and fishing limits will be described by Dr. Geoffrey Burgess, director of Torry Research Station.

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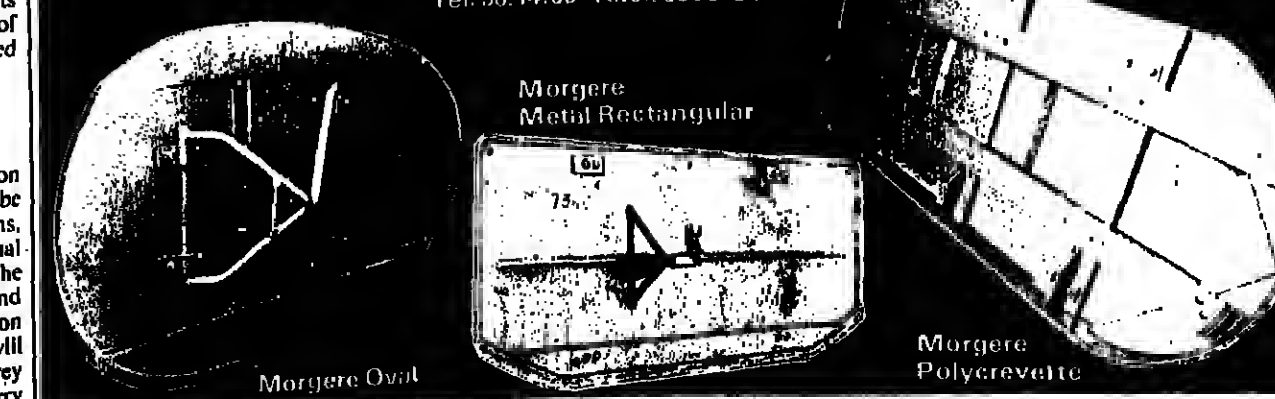
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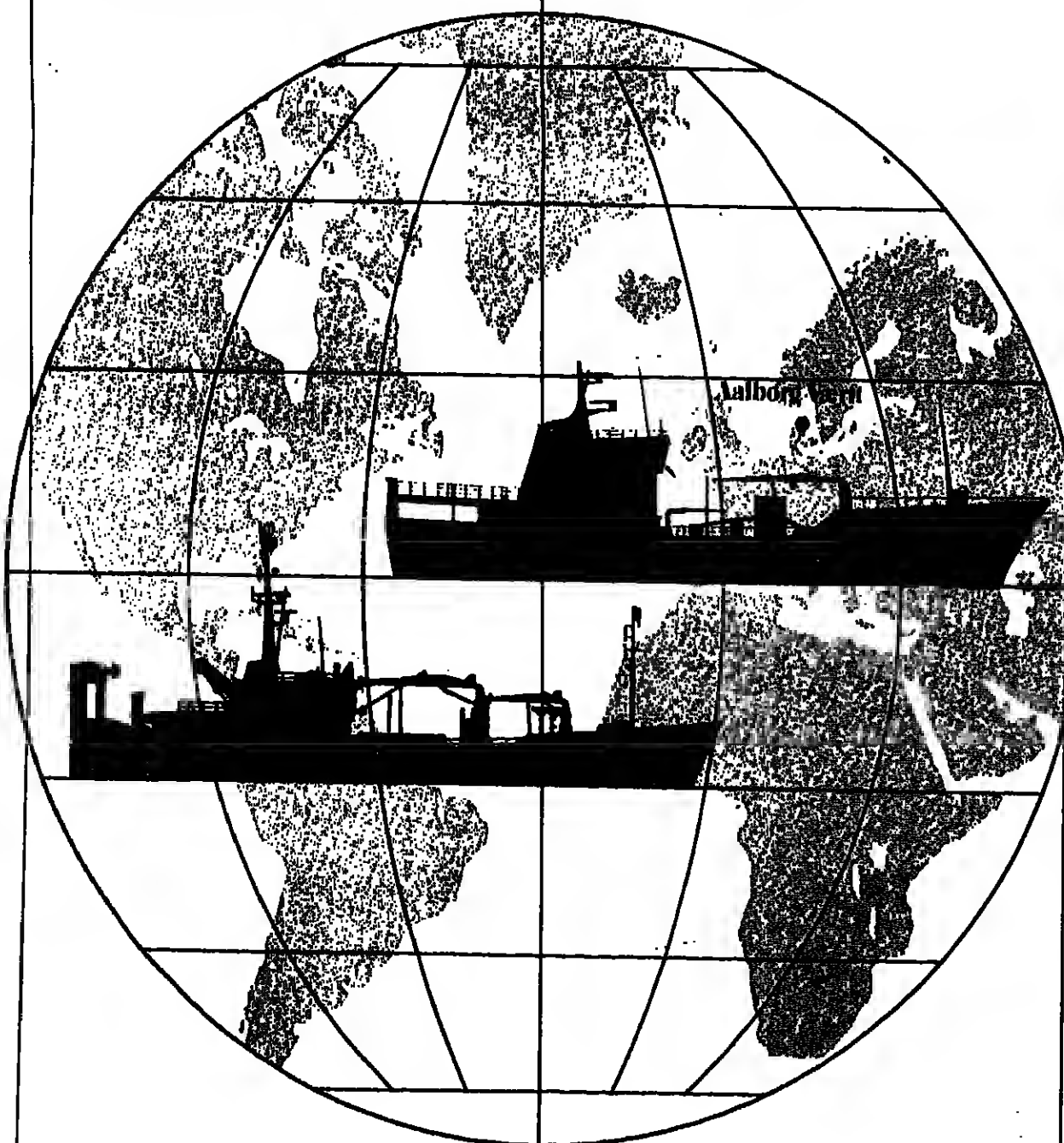


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The books page

continued from 57

TASTE OF TAIWAN'S VARIED SEAFOOD

THOSE of us old enough to remember the events leading up to the establishment of what is now Taiwan will hardly be surprised to learn how that island's independence has been strengthened by a vigorous fishing industry.

Fortunately, fish are abundant and varied in the warm, semi-tropical waters of the Pacific. The Taiwanese catch ranges from flying fish to shark, and little is wasted.

This is certainly the impression gained from *Fishery Products of Taiwan*, an excellent booklet prepared by the joint Commission on Rural Reconstruction (JCRR) and edited by three of its contributors. One of a series of JCRR fisheries booklets, this one could serve as a subtle piece of sales promotion for Taiwan's already considerable fish and seafood exports.

Catch boosted

The Taiwanese fleet totals 800 distant water trawlers, 660 large tuna longliners and over 10,000 inshore boats. They bring in over 800,000 tons of fish and shellfish, a catch boosted by a series of four-year plans from only 122,000 tons in 1942.

Tuna, squid, shrimp, lizard fish, hairtail and croaker head the list of distant water landings. Shrimp comes next with a surprising 10,840 tons. In the inshore fishery, shrimp heads the list at nearly 50,000 tons, followed by shark, sardine, tuna, etc.

Finally, longshore fishing accounts for 32,000 tons of assorted species, while a variety of aquacultural activities produce a further 135,450 tons.

The history of fish and seafood processing in Taiwan began only 20 years ago, when the national catch outgrew domestic demand and export markets had to be sought. Since then, processed tonnage has risen from 48,000 to 130,000 tons and exports — mainly to Japan, West Germany and USA — bring in US\$122 million for frozen products alone.

Export markets

A number of these products are described and illustrated — some of them in colour — and they look, and sound, very attractive, suggesting that export markets could be further expanded with little effort.

The production of fish balls has a high priority since it effectively overcomes 'species prejudice' and encourages fuller utilisation of the catch. No less than 600 processors produce this delicacy.

Fried, shredded fish sold as 'fish bits' has similar advantages and it is interesting to learn that the Taiwanese version of fish fingers are popular with the children there also. Other products include smoked eel, mullet 'caviar roe', dried shark fin and dried shrimp.

One cannot leave this fascinating industry without reference to the production of agar-agar, mostly from the seaweed *Gracilaria*.

Taiwan also boasts no less than 28 production plants growing *Chlorella*, a single celled green algae having excellent nutritive properties. Production runs at 720 tons a year, from open tanks. Ninety percent of this is exported.

Fishery Products of Taiwan has 91 pages. It is written in English, well illustrated, and published by JCRR as *Fisheries Series 25B* from Taipei, Taiwan, Republic of China. No price quoted.

STRENUOUS efforts on all sides saw the collection from printers and despatch before the end of April of the accumulated orders for the *Multilingual Dictionary of Fish and Fish Products*, so eagerly awaited by customers.

The response has been gratifying. The volume itself is handsomely bound and has been most favourably commented upon by recipients — some have even enlarged their orders. This is a nice tribute to the good work done by the OECD scientists and their collaborators in many countries over the ten-year period since the first edition was issued.

During that time they have steadily accumulated identities in national names and have filled in such minor gaps as there were in species. Notable new entries are blue whiting (*poutasson*) and krill.

Interest in these species has grown considerably in recent periods and the extra information is especially interesting. Krill, for instance, is "looking like small shrimp but without the familiar shrimp bend." They have large blue eyes and under the abdomen are equipped with rows of light organs which can be lit up or extinguished. Length is up to 5cm. and life span two to three years.

Eighty species

One variety is prevalent off the Norwegian coast, but main interest centres in the Antarctic, where are found at least 80 species of which 30 are euphausiids, the most prominent being *Euphausia superba*.

Now I had never met a euphausiid nor is it listed in the Oxford Dictionary. But I found the description in *Chambers Dictionary of Science and Technology* and think it worth quoting for several reasons. Here it is: "An order of *Eucarida* in which the exopodite of the maxilla is small, none of the thoracic limbs are modified as maxillipeds; there is a single series of gills, standing apart the coxopodites of the thoracic limbs; and there is no statocyst. In habit they are marine and pelagic and form part of the diet of whales."

As is well known, a number of nations are vigorously exploring the potential of krill for human nutrition and meal use and our dictionary states "various uses: e.g. to make a protein rich meal or because of organoleptic and pigmentation properties as a component of wet feed when farming salmonids." Nearly all nations have names for krill. With depletion of whale populations, that of krill is burgeoning.

To guard against the undue enrichment of the resources of the Antarctic, the Australian government convened at Canberra in February-March a meeting of the 13 nations specially concerned in Antarctic fishing to discuss a possible convention aiming at proper conservation practices. A further meeting will take place in Buenos Aires in July. This is sensible and shows the lesson is being learnt.

Both Australia and New Zealand have now established 200 mile fishing

walkabout talkabout with Arthur J Heighway



limits round their shores with significant effect upon the operations of foreign-owned vessels. Hiberno, Australia's zone extended only 12 miles from shore and even that limited zone was habitually abused by foreign vessels, principally Taiwanese and Japanese.

Over a short spell of recent years 78 encroachments were recorded and convictions maintained. Now the heavy hand is falling and recent violations are being met in both countries with heavy fines and forfeiture on occasions of gear, catches and even vessels. With extension to 200 miles the problem of supervision intensifies.

Australia's coastline approximates 11,000 miles — an old swagman is currently finishing a four and a half year walk around it — and as the circumference of that 200 mile limit would greatly exceed that 11,000 mile, the square mile area of the new limit certainly constitutes the largest single national fishing area in the world.

I leave it to the mathematicians to work out that area in square miles. But it gives Australia great scope for fishery development.

We have in hand from Peter 'Powmull' editor of that excellent monthly *Australian Fisheries*, a book dealing with the current fisheries of Australia as they have been developed. This will appear towards the end of this year. Meanwhile, the Australian government is embarking upon its programme of co-operative investigation with interested foreign interests by outlining broad plans for feasibility exploratory enterprises in certain defined zones — those areas far established fisheries already exploited by Australian interests are reserved exclusively for its own fishermen.

Consensus

This policy is in line with a consensus of opinion established during the progress of the Conference on the Law of the Sea hopefully concluding soon its final session at Geneva. That consensus requires that nations hitherto unexploited stocks in their waters must grant concessions for their exploitation to other nations.

It is on that basis that Canada is currently deriving an estimated annual income of ten million dollars a year simply from fees paid by foreign vessels for the right to operate in their waters. Up to 1,500 such vessels have operated there annually in the past

and Australia, in planning her feasibility ventures, will doubtless benefit by Canadian experience.

Some countries in permitting activity by foreign vessels in their waters based the fee to be paid upon the catch secured, but this has proved difficult to operate; it has also led to waste by the dumping of good fish other than that specifically desired. Hence Canada has turned to the simple and direct system of a fee for the time spent in the zone.

The southern areas of the world — Argentina, Australia and New Zealand are all concerned to use their fish resources as now established by enlarged zones to counter as far as possible the damage inflicted on their economies by the self-sufficient policy of Europe.

New Zealand, for instance, with her plentiful and cheap production of lamb, wool and dairy produce is specially urging Japan to lower her barriers of customs tariffs and price in return for fishing concessions. So far without much success, which accounts for the stiffer action being taken against Japanese fishing desires which hitherto have operated extensively in New Zealand waters. Australia is following much the same policy with missions to Japan this year.

Conger eels

Strange things are happening in the depths of the North Sea. Divers concerned with checking the oil pipelines report that conger eels of great size and ferocity are finding good homes under and around those pipes — maybe by the provision of slight warmth from the passage of the oil in the pipes. The eelers are said to renege ten feet in length and be as thick as a man's thigh. And further north in the Arctic a Norwegian expedition has found that whereas on the surface the temperature was -2°C at 20 metres below it went up to +3°C. Conclusion reached by the Norwegians was that a stray branch of the Gulf Stream was responsible.

David Thomson's book *Pair Trawling and Pair Seining*, the merits of which I justifiably extolled here in March issue, is now available in handsome form. With the change to more varied forms of fishing occasioned by the changed fishing limits, this technique is proving particularly attractive and economical. Some remarkable returns have been recorded in the fishing press by practical operators.

Two prizes for tags

TWO \$300 prizes have been awarded in the latest tuna tagging lottery held by the International Commission for the Conservation of Atlantic Tunas (ICCAT).

The prizes went to Manuel da Silva (Portugal), skipper of the *Centaura*, and Wang Jung En (Taiwan) of the *Rucy Yih No. 2* for their recovered tags.

The lottery, held on April 14 at ICCAT headquarters in Madrid, is an annual event.

For the past seven years, ICCAT member countries have conducted joint international tagging experiments in the Atlantic. In these experiments, scientists in research vessels catch tuna, attach tags and return the fish to the sea.

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TASTE OF THE ORIENT



THE INCREASED acceptance in European countries of the relatively exotic foods sold by Indian, Chinese and Japanese restaurants has sparked off an equivalent growth in dehydrated, frozen and canned versions of the more popular recipes, produced by the home industry. Yet, among the packs of dried curries, the sweet and sour and other foods, fish gets a very poor showing.

True, the many varieties of prawn are never far away, but in Britain, for example, one suspects that these are imported anyway. Apart from cook-in-the-pack kipper and cod-in-sauce, fish is hardly jumping on the exotic food bandwagon.

It is not suggested that children should be prised loose from Captain Birdseye and his fish fingers, nor that the fish and chips addict be parted from his Great British Invention.

Girls sort and pack a mackerel catch. This is one fish common to Europe and Taiwan.

But there could well be an untapped store of goodwill for eastern fish dishes just waiting to be exploited.

There is no lack of variety in the Chinese and Japanese treatment of fish. In many cases, the recipes appear to be ideally suited to the processor's dream of fish without shape and identity.

To seek the market leaders of the future, we could do worse than go to Taiwan. There, the need to develop export outlets for fish has led to the commercial production of many fishy delicacies both for home consumption and for export. Some of these are described at some length in *Fishery Products of Taiwan*, published by that country's Joint Commission on Rural Reconstruction (See Books Page 51).

One of Taiwan's most recent successes is a ready-to-cook frozen product known as fish dumpling. This, it appears, has become an almost indispensable ingredient of Chinese sukiyaki.

Dumplings

Fish dumpling has an outer "skin" of minced fish inside which is a stuffing of minced pork, dried mushroom and other seasoning which, unfortunately, is not described in detail, though this could be a rewarding area for experiment.

Even more successful is the story of roasted eel, which currently earns US\$10 million in exports as a frozen product. Processing consists of filleting and cutting into four inch (10cm) lengths, four of which are speckled side by side on to three small bamboo sticks as flattened fillets. They are now ready for cooking, which is done all or partly in an open flame oven and in some cases, partly in a microwave oven.

The sections pass through

Can the processing industry catch-in

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product, greater care is taken to destroy bacteria and avoid contamination. Here the open flame oven, followed by a three-second dip in a 10 per cent brine solution has proved effective.

Eels used are all farm grown and of a weight equivalent to three or four to the kilogram. Before processing, they are kept without food for two days to clear the gut.

They are now cooled to reduce activity—in water at deg. C for two to three hours or in ice. Sometimes they are bled by making a knife cut behind the head and this is followed by gutting, using a special knife, then heading and filleting.

Production

In commercial production, the fish is headed, gutted, scaled and deboned before being chopped. Cold water is then added and the mixture stirred and allowed to settle, when the liquid is decanted. This is repeated several times and the water-soaked muscle then centrifuged and pressed onto a cake, which is minced, mixed with sugar, salt, polyphosphate and other additives. The resulting mix can be made into fish balls, fish sticks, fish tempura and fish sticks.

A great deal of minced fish is used in China, Japan and elsewhere for "fish balls"—said to be as popular there as potato crisps in England.

Fish balls are made from low-priced pelagic Pacific fish such as lizard fish, big-eyed snapper, ribbon fish, amber fish, horse mackerel and sardine.

Processing

Processing consists of washing, heading and gutting, after which the fish is brined in 16 deg. Be, or dry-salted to 3-5 per cent by weight. The salting slightly denatures the protein to improve muscle quality, the fish being washed afterwards to remove the salt.

Cooking is carried out by steaming for 5-30 minutes, until the backbone comes away easily. The fish muscle and bone are separated by means of either type of deboning machine—screw press or belt and screen. The fish flesh is then centrifuged or pressed to reduce liquid content and cooking time.

Large pans with mechanical stirrers cook the fish until moisture is down to 25-45 per cent and until temperature at the centre is maintained at 85 deg. C. The minced fish is mixed with sugar, vegetable oil, soya sauce, shortening, salt, MSG, liquorice, pepper, aniseed and fennel seed. The end product is then packed in glass jars, cans or flexible packs having a content of 60-80 per cent fish and with a protein content of 37 per cent. The apparently high lipid level of 21.3 per cent is almost entirely due to the added oil and shortening.

This obviously ready acceptance of minced fish must surely provide a crumb of comfort to those European and North American processors who have become advocates of minced fish, but who cannot find sufficient market for it.

Buyers at a Taiwan auction. This fish will provide local processors with material for a wide variety of tasty delicacies. Smothered with spices and sauces, the original flavour and appearance of the fish disappears.



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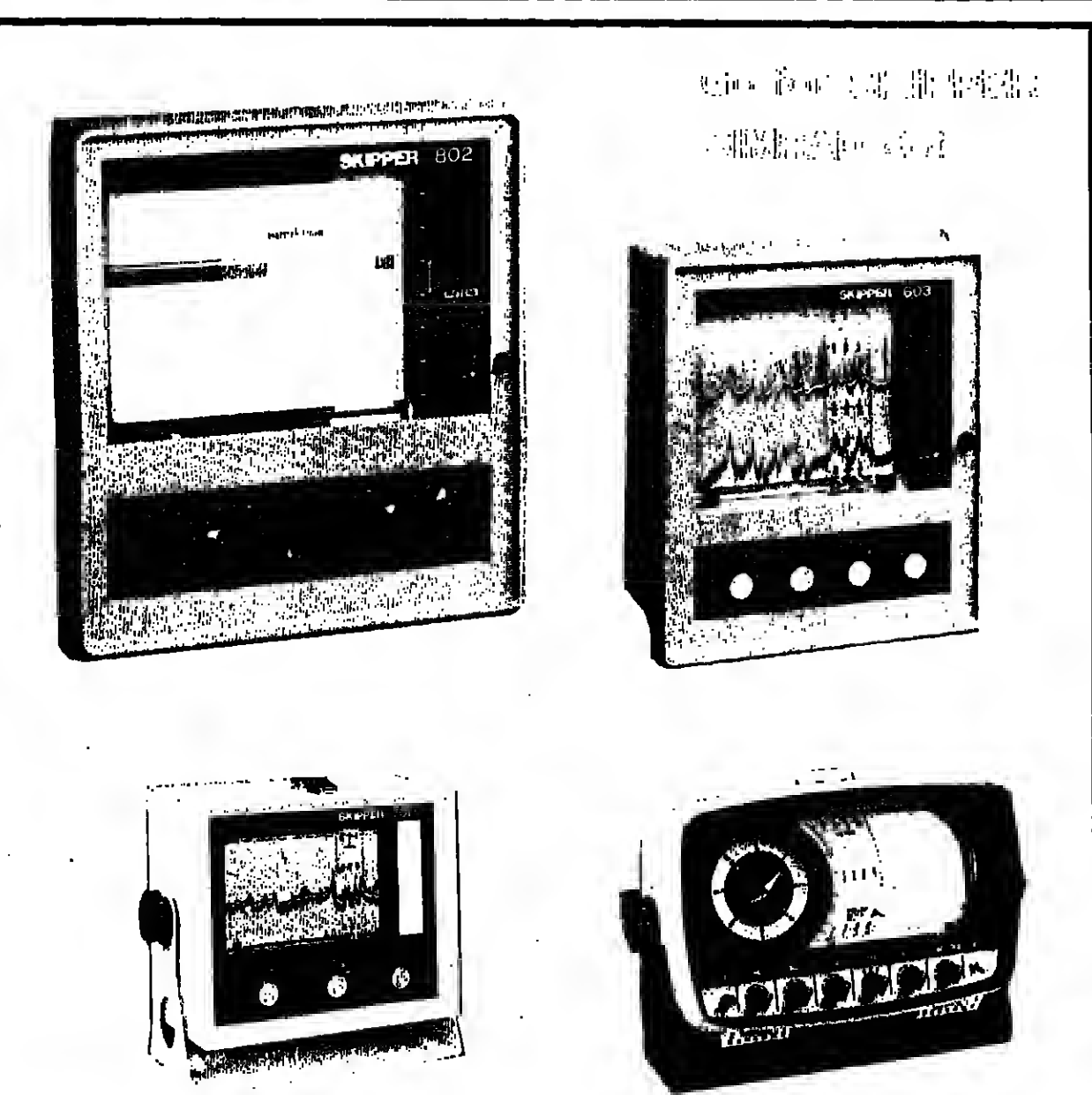
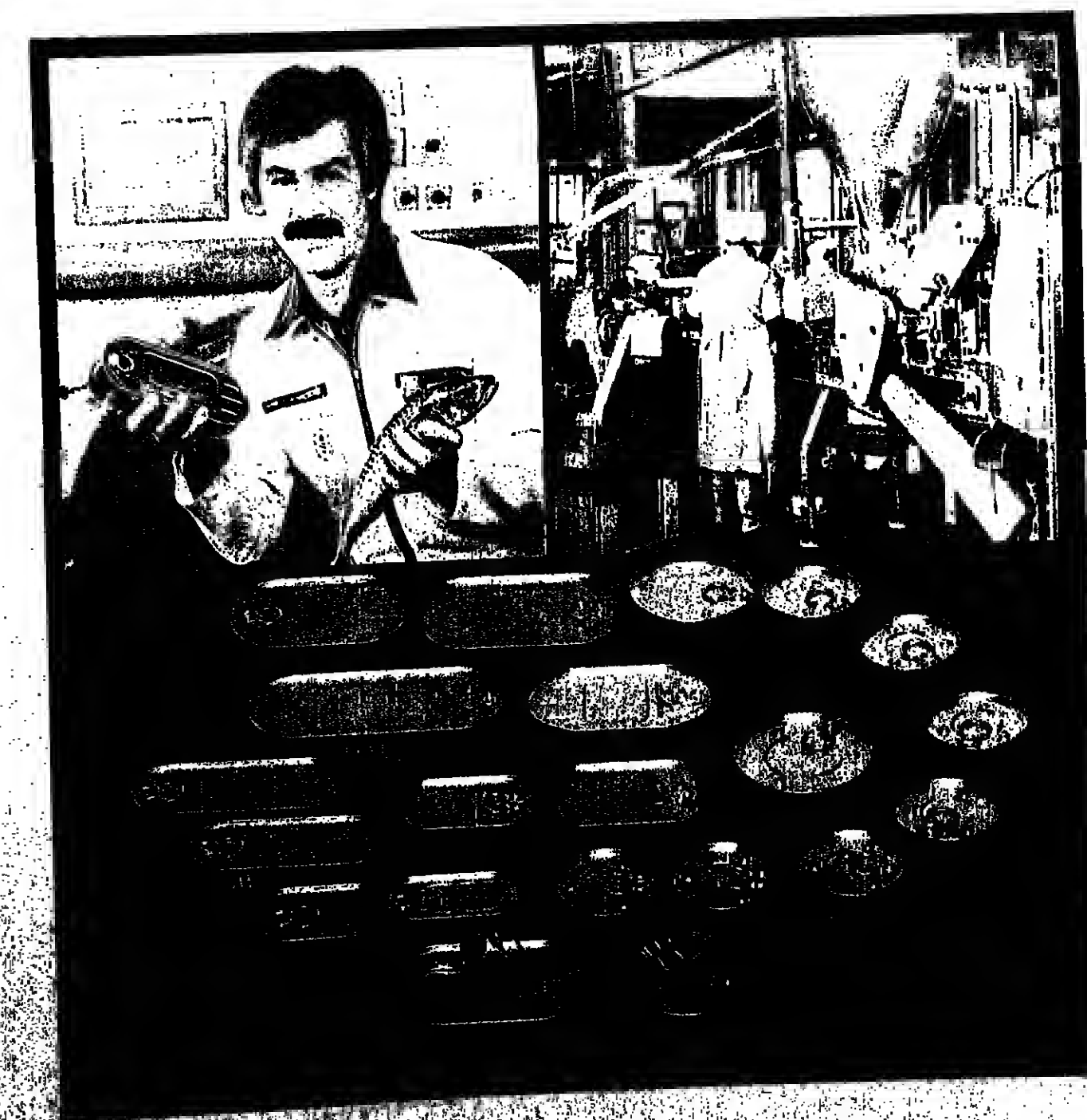
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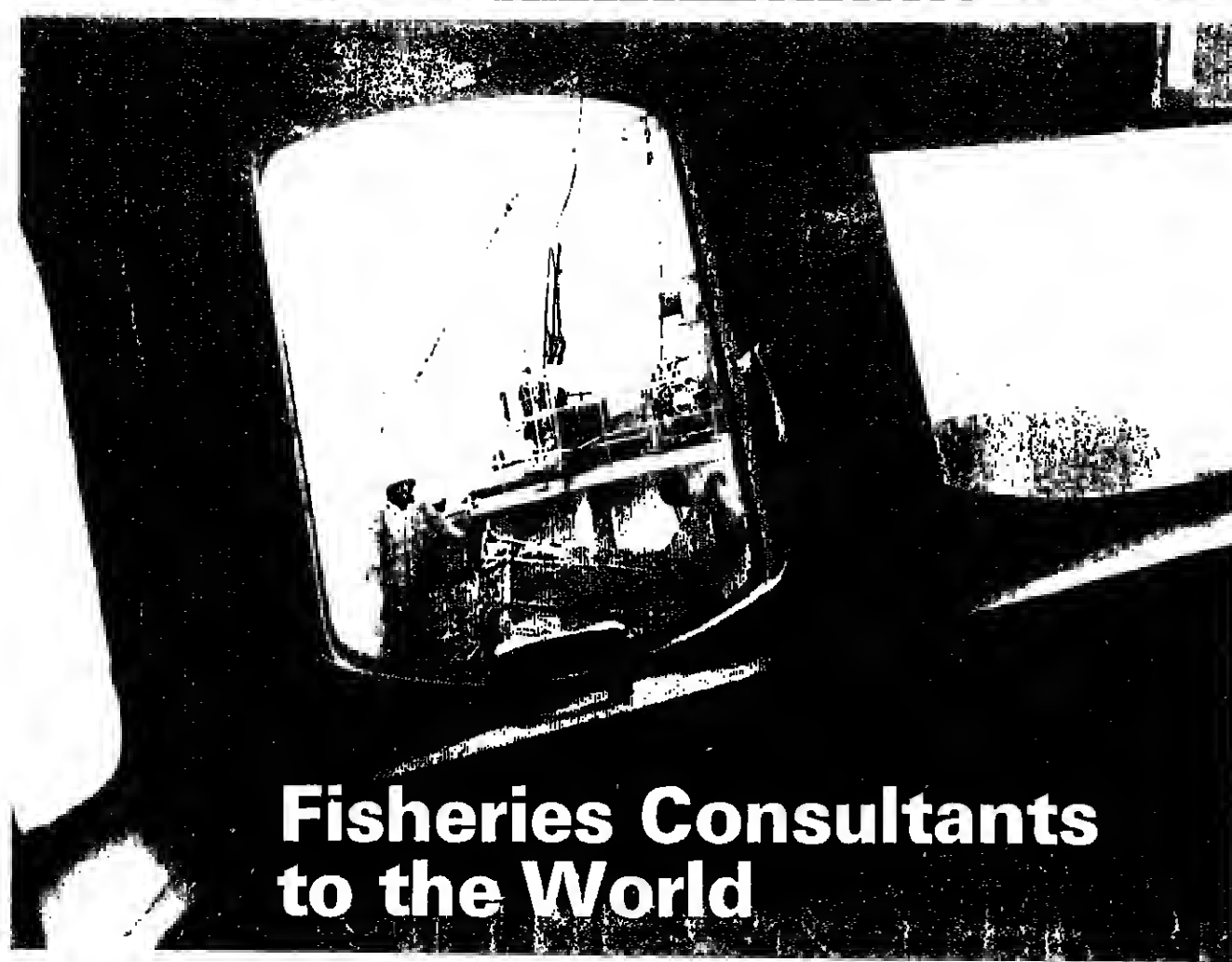
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Raw material for fish balls? For Eastern delicacies could well become market leaders.



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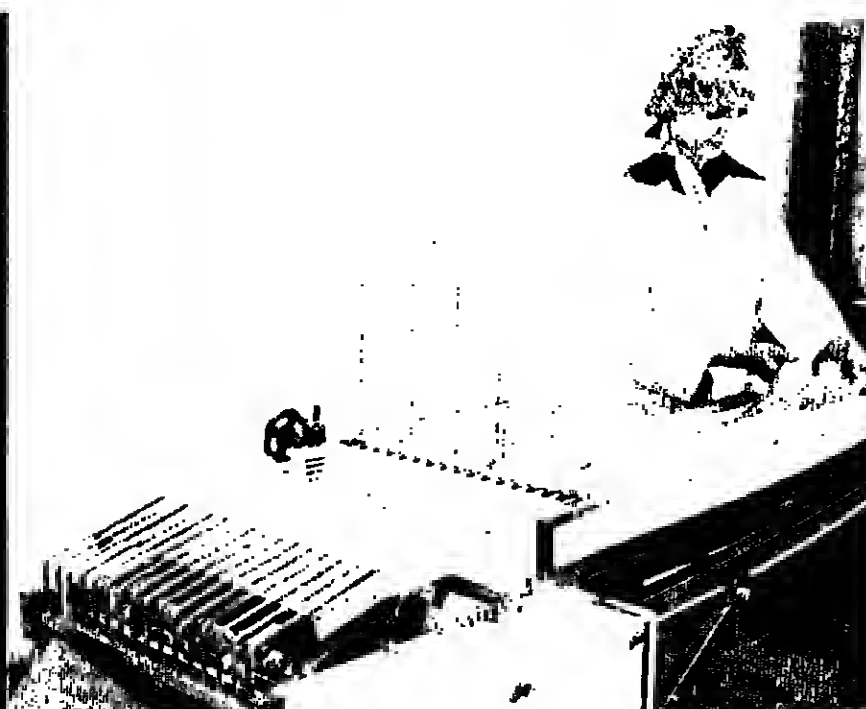
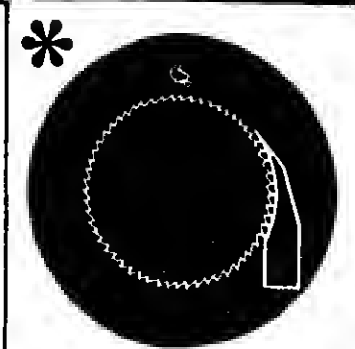
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The 'wealth' of Sahel



THE SAHEL zone fringing the western Sahara desert is one of the poorest regions in the world. But it could have an enormous source of wealth in its varied stocks of fish although most of these are still only lightly exploited.

However, the potential is understood and efforts are being made to develop fisheries. At a recent meeting at FAO headquarters in Rome representatives of the Sahelian countries and of organisations working in the region agreed to a series of development programmes, including a \$27 million research and training centre.

Feed people

Fisheries already help to feed people in the Sahel, supplying them with as much protein as traditional cattle herding. But they could help much more, according to participants in the meeting.

These include representatives of the Club of the Sahel, a high-powered international organisation made up of donor countries, and of the Permanent Inter-State Committee for Drought Control in the Sahel, which is made up of eight countries in the region.

The participants noted that fishery production in the region had been slowed down by obsolete fishing techniques and inadequate preservation and marketing.

They agreed to the setting up in Mopti, in Mali on the banks of the River Niger, of a regional centre. This will provide training and will carry out research into inland fisheries in the region.

Canada, Norway, the Netherlands, West Germany and the United States all said they would be contributing to the projects. The representative of the United States said his country would cover up to 25 per cent. of the cost of the Mopti centre.

Fishing will help relieve one of the world's poorest regions . . .

Spanish ships in joint ventures

THE SPANISH fishing industry, with its large deep-sea fleet hit by 200-mile fishing zone, has been searching the world for new opportunities.

Earlier this year, the journal *Industrias Pesqueras* reported that more than 100 ships had left Spanish ports to take part in joint ventures based in Africa and South America.

Spain is, of course, no newcomer to long range fishing. In the modern era of the distant water freezer trawler, for example, it was a small freezer side trawler from Pescanova in Vigo that in 1961 pointed the way for European ships in the rich late waters of the South Atlantic.

The waters off Southern Africa are still the best source of hake, the most popular fish in the Spanish diet. Although South Africa has claimed a 200-mile economic zone, this stops at the border of Namibia (South West Africa). A long stretch of coast with hake grounds offshore still only claims a 12-mile limit until independence talks decide the future of Namibia.

100 vessels sail for Africa and South America

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Other South American joint ventures involving Spanish companies are in Mexico (with five ships from 250 to 412 tons), Ecuador (with six ships from 200 to 280 tons plus the 800-ton Aros), and Venezuela (with five ships — the *Costa de Marfil*, *Avior*, *Alpes*, *Jose Cornide* and *Eduardo Chao*).

In Peru, the Spanish company Alvarez Entroca in Huelva is using four vessels in a joint venture with a local company.

Three large vessels — the *Santa Marina* and *Santa Elisa* from the Pebsa fleet and the *Amorante* from the Pescanova fleet — are operating in Uruguay.

The 600-ton *Alamo* is being used in a joint venture in Chile, and the 1000-ton *Ciclon* in Brazil.

Morocco follows close behind Argentina as an area of Spanish fishing involvement. There are now more than 30 ships working in ventures there.



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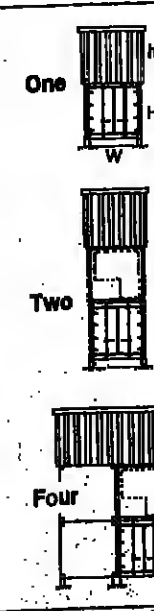
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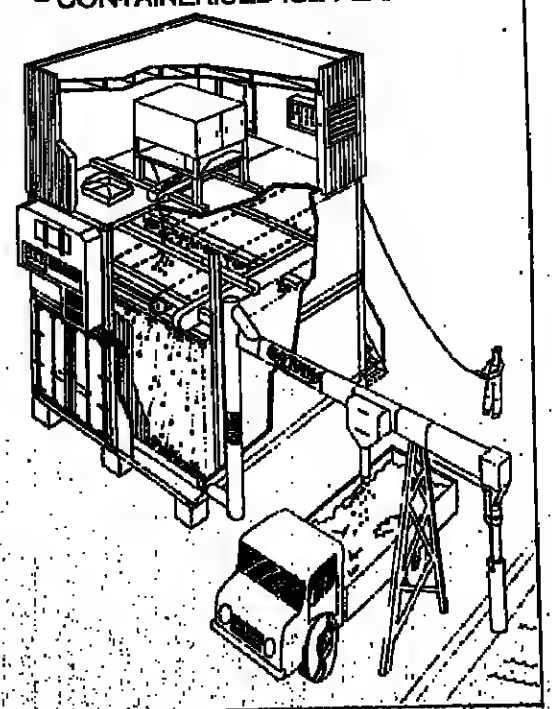
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When is a salmon ready for sea?



Salmon programme leader Anthony Novotny (left) at a salmon cage farm on Puget Sound.

MEASUREMENT of an enzyme in the gills of hatchery-reared Pacific coho and chinook salmon could prove a boon to sea ranching by helping to increase the return of these fish.

Much of the pioneering work on salmon farming and ranching in the United States is being done in field stations of the National Marine Fisheries Service in Puget Sound around Seattle, and in Alaska. Technologies have been developed which have led to new commercial aquaculture projects, both in the USA and in other countries. Workers in these stations have also evolved new concepts for salmon enhancement programmes within the public hatchery system.

One study becoming more important is into the "smolting" of juvenile coho and chinook salmon in relation to their successful adaptation and growth in the marine environment. And a strong indication of smolting — and therefore readiness for migration and adaptability to seawater — is the level of sodium and potassium salts of an active enzyme called adenosine triphosphate (ATPase) in the gills of the juveniles.

Leading the work at the NMFS Aquaculture Experiment Station on Puget Sound is Anthony Novotny. During the smolting stage, he says, the young fish take on the external characteristics of the seaward migrant. Lateral markings (parr marks) begin to fade and the increase of guanine in the scales gives the body its silvery iridescence and the ratio of body weight to length decreases. Also, biochemically, nature prepares the fish for its change in environment from fresh to salt water.

This is a critical period for survival of hatchery migrants. It depends largely on "the status of smoltification" and their ability to pass rapidly downstream, through the estuary and into the sea.

But it is no simple matter to determine when hatchery stocks should be released.

It has been found, however, that in wild stocks migratory movement to the sea is closely associated with the increase in ATPase activity. Therefore, when a pronounced increase in ATPase activity is observed in samples from a batch of hatchery fish, this can be taken as convincing evidence that the fish are ready for seaward migration and salt-water adaptation.

Evidence

Looking at what might be done with the monitoring of ATPase levels, Novotny notes that it is a useful biochemical indicator to precisely establish the transformation of the parr to smolt state, "and to predict the optimum time for release."

Measurement of ATPase activity was included in a pilot study of nine stocks of salmon from five hatcheries on the Columbia River. These were to determine status of smoltification and fitness for ocean

Enzyme shows smolting in chinook and coho

survival of the fish. The main reason for the development of these hatcheries, explains Novotny, is to enhance natural runs that have declined due to dam construction on the river. The hatcheries have had great success in providing salmon for fisheries in Washington and Oregon states.

Favourable

According to Novotny, releases on this scale are justified by favourable cost-benefit comparisons. And even larger production is being proposed. But stepping up releases may not be the most cost-effective way of improving the fishery.

"Fishery scientists," he explains, "now recognise that the release of smolts better fitted for marine survival may not only produce the same results as increased production but at a cost lower than that required to build and operate new hatcheries." Scientists at the North-west Fisheries Center of the NMFS estimate that 20 per cent of the coho salmon from Columbia River hatcheries survive the first year after release.

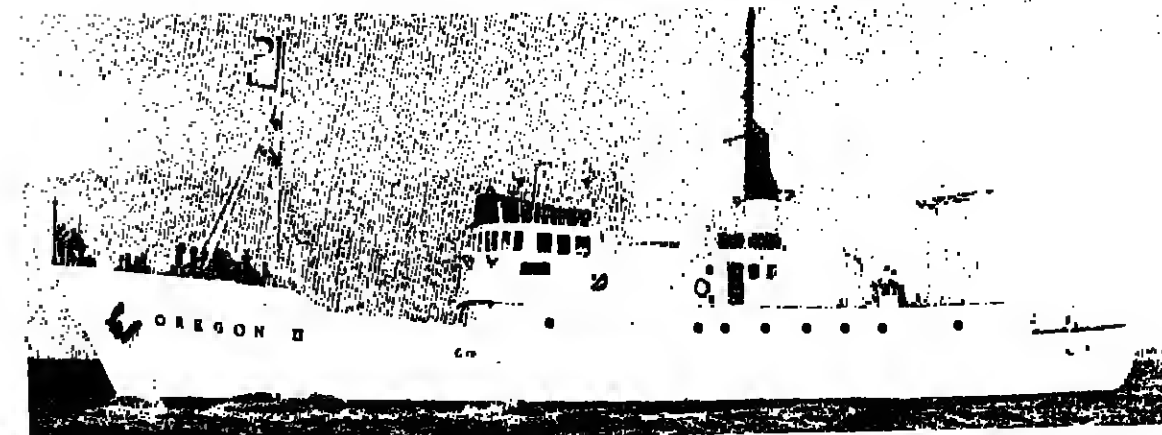
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SCARLET PRAWNS THAT THRIVE ON OIL



THE CONVENTIONAL view of oil in the sea is that it is harmful to marine life. But American research workers have found a species of prawn that appears to thrive on hydrocarbons.

Their discovery arose from investigations started years ago on the effects of ocean-floor oil deposits on deep-sea animals. Such deposits may result from weathered oil that has sunk to the bottom or from natural marine seeps.

According to the US National Marine Fisheries Service (NMFS), an association between deep-sea oil

and marine life was first noted in 1970 during a cruise of the research ship Oregon II. Off the north-west coast of Aruba, Dutch West Indies, large numbers of scarlet prawns were encountered where oily material was present.

Three years later the Oregon II returned to the same area. Samples of marine life from polluted and non-polluted areas were collected for analysis along with samples of the oily material itself. Again, substantially larger quantities of scarlet prawns were caught where oily material was found.

The prawns were collected by trawling at 21 locations where depths ranged from 502 to 732 metres. In 11 of these

areas, oil lumps of various sizes were found. The other areas showed no oily material.

When the catch data was analyzed, the researchers found that scarlet prawns were 2.9 times more abundant where the oil was. A comparison of the total scarlet prawn catch from three polluted and three unpolluted stations, matched for depth

contours, showed that prawns were 4.5 times more abundant at those stations contaminated by oil.

The NMFS says that the process that causes scarlet prawns to prefer oily areas can be explained by what happens to oil at sea.

After a few days, the toxic components of oil disappear. Within one to two weeks, a

large microbial population begins to attack an oil slick or lump. This produces chemical compounds, including alcohols, amines, and aldehydes.

The oil, in combination with the organisms feeding on it, develops into more food and this brings in the prawns.

By exploring the relationship between scarlet prawns

and submerged oil, the investigation, says the NMFS, has provided new knowledge about the accumulation of hydrocarbons by deep-sea organisms.

Because many fishes feed on such benthic invertebrates, studies such as this one are seen as essential to an overall understanding of the long-range effects of pollution.

A herring's built-in computer

A STUDY by the Marine Biological Association laboratory in Plymouth, England, indicates that small shoaling fish such as the pilchard and the herring may have a computing mechanism previously unknown in the animal kingdom.

Fish hearing is already known to be spread over a very wide range. It is now being shown to have a uniform ability to hear sounds from ultra-low to ultra-high frequencies. This faculty also extends over the range of depths in which the fish may move, and the speed at which it changes depth.



But there is also another aspect of fish sensitivity. The lateral line in the herring and other species has sense cells that inform the fish of pressure and water movement.

Reporting on the work of Sir John Gray and Professor E. J. Denton, Anthony Tucker, science correspondent of the Guardian newspaper, notes that the herring family (the clupeids) possess a lateral line "whose complexity and structure are quite extraordinary."

Clupeids, it seems, can listen on more than one channel at the same time to several sources of underwater sound.

"It amounts," writes Tucker, "to a sonar system depending not on sending out sounds and waiting for a reflection but on the difference in kinds of sound received from the same source."

The herring can probably sense the direction of source of sound, its absolute energy, and compute its distance.

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FAO takes on the sealers...

SIR,

We refer to your column From the Dockside on seal hunting in your March issue. We do not wish to take a position with respect to the Council of Europe resolution, but simply to point out that your account of the issue omits several very important considerations, and is therefore, somewhat lacking in balance.

A. The seal stocks, unculled, will not increase indefinitely and infinitely. They will be limited by breeding space and by food supply.

It is significant that they are said to be increasing rapidly despite the fact that man is reducing the abundance of some at least of their food items, by, for example, the huge capelin fishery and the take of Atlantic cod and herring.

This must mean that not only are the seals not limited by the capelin, but also that the capelin and other fish are not limited by the seals. Indeed, the harp seal diet includes cephalopods, crustaceans, herring, redfish, sculpin, sea raven and various flatfish, as well as cod and capelin. The proportions of these in the diet are not well known, and are in any case most unlikely to remain constant in the face of changes in relative abundances.

B. It is necessary to consider whether and to what extent the seals eat species other than those preferred by man, and whether the former species compete for their food with the latter. It is not as simple as saying that A eats B, therefore if less of A then more of B.

C. The capelin are used entirely for livestock feeds — this is profitable but is not an efficient use of a food resource and the product does not go to hungry people. Also if "culled" seals were used as a meat source the situation might be different — but a very large proportion of seal meat has until now simply been thrown away.

D. The fish, like capelin, eaten by seals are also the food of larger and much more valuable fish like cod. Man is also exploiting some of these: cod, and the three main species in its diet — capelin, herring and sand eels.

When capelin are reduced — by fishing and possibly by seals — so much that cod production falls, then we might worry about the seals, but even more about the cod.

This might already be happening. If it is, the answer from the point of view of providing food for people might be to help the cod by reducing the exploitation of capelin. If it is not, then predation by seals on capelin is not so severe.

E. Arithmetic calculations such as that of Nick Wade on the total quantity of food taken by a population are notoriously misleading.

Firstly, any estimate of current food consumption by a wild animal population is subject to wide range of cumulative error.

Secondly, it is incorrect to assume that if a population increases by a certain factor its food consumption will increase by the same factor, even approximately. We have the same problem with whales — in reverse. It is assumed

COMMENT WAS LACKING IN BALANCE

that if whales are reduced to, say, 20 per cent of their former abundance, the whale stocks will consume only 20 per cent of the krill they used to consume. Thus, goes the argument, the remaining 80 per cent is left for man to take. Not so. In fact the response of reduced populations of whales is to consume more — perhaps much more — krill per whale, and to grow faster and mature and breed sooner.

Conversely, as the seals increase, the food consumption

NORWEGIANS REPLY

The Editor comments:

Apart from surprise to find FAO expressing such concern over the activities of two or three of its developed member countries in northern waters, I am puzzled how Sidney Holt and Joanna Gordon-Clark feel they can comment as they do without taking a position with respect to the Council of Europe resolution.

The whole tenor of their letter indicates that they are in favour of the Council call for a two-year ban on seal culls. And, as they write in their official capacities, we must assume that this is the position of FAO.

As the column made clear, the evidence quoted by our correspondent Nick Wade in Bergen was obtained from the people involved in seal research in Norway. To be more precise, he obtained it from Torger Orntland and his staff in the Mammal Division of the Institute for Marine Research.

We have therefore gone back to this Division, whose initial general reaction to the letter was that its writers appeared to have failed to have kept up with the latest results of seal research. They also appear to make invalid transfers of competence on fish to mammals.

Answering the points in the letter, the Norwegians say: A. It is inconceivable that harp seals will be limited by breeding space. The crowding factor, which does influence the stocks of seals whelping on land, does not apply to seals whelping on ice. There is always more than enough ice.

Not will the seal stock be limited by food supply, because the seal will compensate with one sort of marine food for what it does not get of another. The writers cite

Letters...

of their populations is not likely to increase proportionately — they will grow more slowly, breed less, and may stabilize at a level which is not necessarily disadvantageous to man.

Some managers, and even some scientists, respond to such arguments by saying "reduce the seals nevertheless for their own benefit, to make the survivors fatter but healthier" — but that enters another field of discussion concerning domestication, selective pressures and evolution which is beyond the scope of the current debate.

F. You note that Greenlanders will be particularly hard hit if they are not allowed to catch seals. It is relevant that Greenland Eskimos are now able to catch far fewer seals than in the past. They take older seals, several months after the more highly capitalised kill of pups by Canada and Norway and the main cause of the present lower catch by Eskimos is thought to be the high levels of kill by these two countries. If, as your article indicates, one-fifth of the Greenland population depends on sealing for its income, the existing management policy, supported by fishermen who claim competition by seals for fish, does not appear to favour the Eskimo.

Finally, the degree of competition from seals for commercial fish, the existing levels of harp seal populations and the catch that would allow them to remain stable or increase slowly remain the subject of controversy.

Joanna Gordon-Clark,

Marine Mammal Consultant,

S. J. Holt,

Adviser on Marine Affairs, Fisheries Department, FAO.

this latter fact but fail to draw the logical conclusion from it. C. The proportion of seal meat going to human consumption is on the increase. D. There is no doubt at all that the capelin population is reduced by seal predation. E. To say that increases in the seal stock will mean a linear or proportional increase in food consumption is a very cautious opinion.

It is more likely that consumption will increase exponentially, because the struggle for survival in an uncontrolled population will leave the individual seal in poorer health with a meagre fat layer unable to conserve body warmth. This will in turn cause higher metabolism and therefore constant feeding in compensate for the inefficient use of energy. This phenomenon can be compared to living in a house with poor insulation.

Recent research at the Department of Physiology, University of Oslo, indicates that abnormally high metabolism in the harp seal is the result of inadequate diet. A smaller, controlled stock is healthier and makes more efficient use of its food. F. The relationship between Canadian and Norwegian sealing and the kills made by Greenland Eskimos is not clear. One of the reasons for a drop in Eskimo take is a change from a hunting to a more modern culture. Statistical evidence is needed.

On the final point about scientific controversy, the Division notes that the scientists in ICNAP's Working Group on Seals are now unanimous in their estimates of stock size.

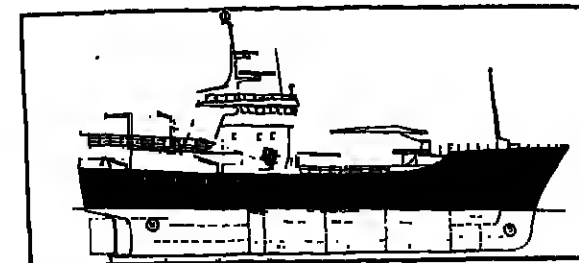
Dr. D. M. Lavigne of Canada has corrected his earlier divergent view (which was much lower than three other estimates) of the size of the harp seal stock.

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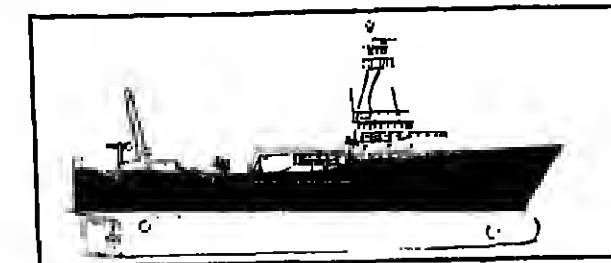
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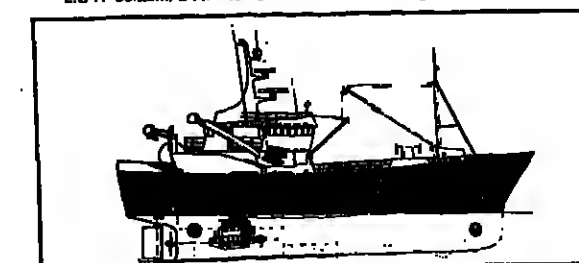
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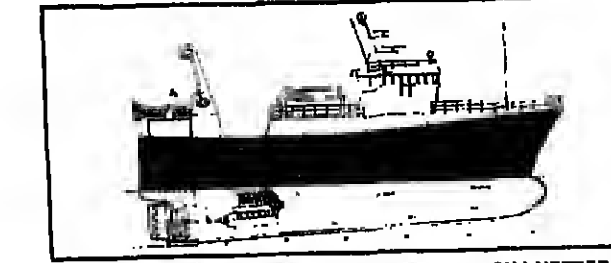
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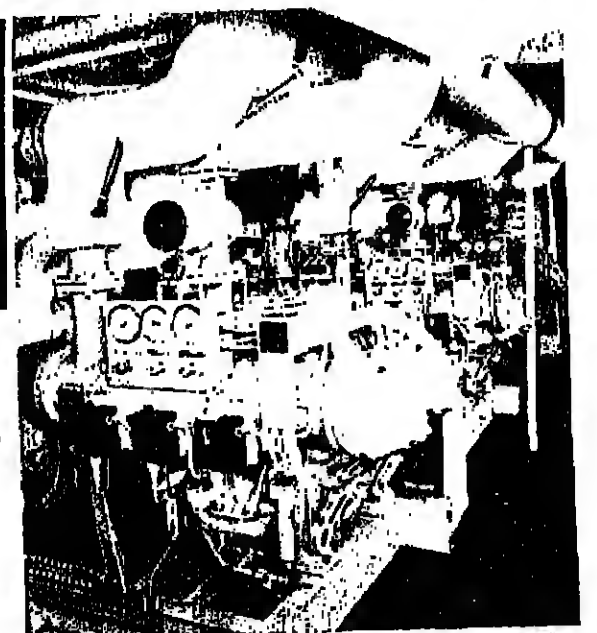
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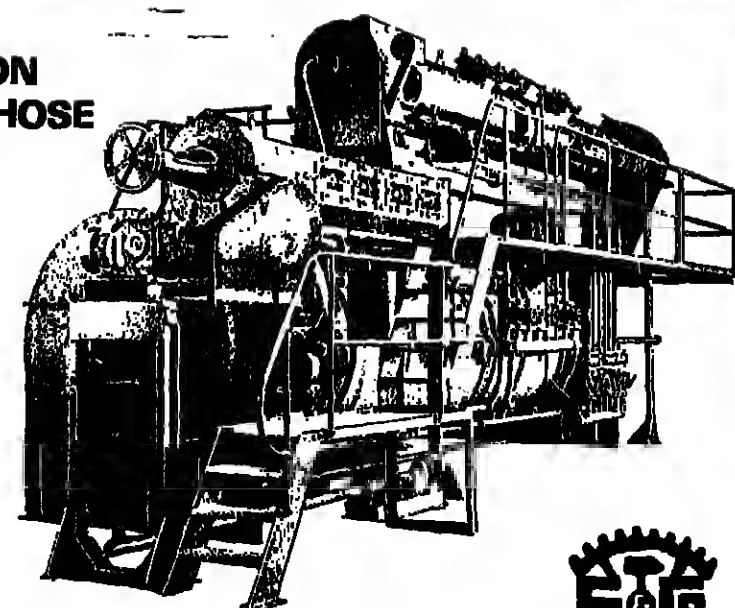
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Busy Bangor

From page 46.

Milford Haven harbour and its cold store unit there, and also with the firm's other branch in Newport in South Wales, which is essentially a selling unit and most dependent on Bangor and Milford Haven combined.

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for Bangor's fish include the nearby city of Liverpool, also Birmingham and Manchester as well as London's Billingsgate Market.

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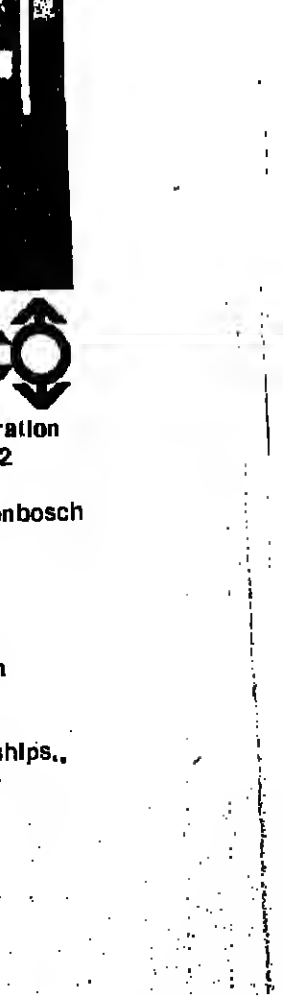
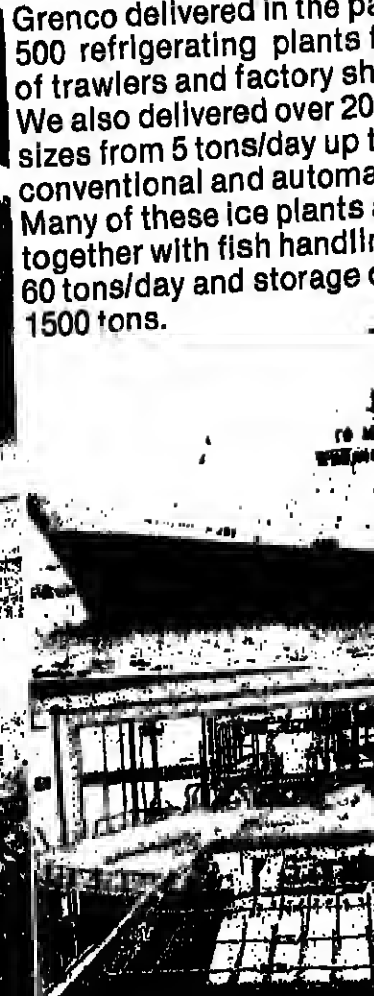
From page 52.

The failure of costly harbours to attract permanent fishing communities and use indicates the need to improve traditional fishery centres.

As the small-scale fisheries sector will remain the backbone of Sri Lanka fisheries in the foreseeable future, a master plan based on this fact should be prepared. An analysis of the situation is needed to determine how best

the traditional landing sites can be developed to meet present and future requirements, what other suitable natural sites exist, and how best to introduce better catch and beach landing facilities.

Investigations indicate that the extension services are not providing the support and assistance in development wanted by fishermen; nor is there sufficient reliable data coming from fisheries for use by the national planning authorities.



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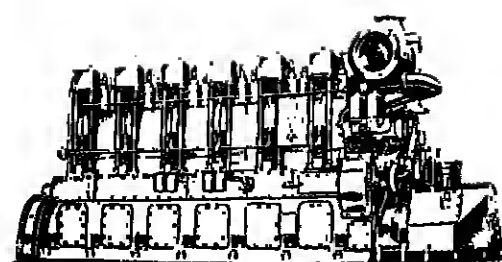
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